JOURNAL
OF THE
Association *of* American Medical Colleges

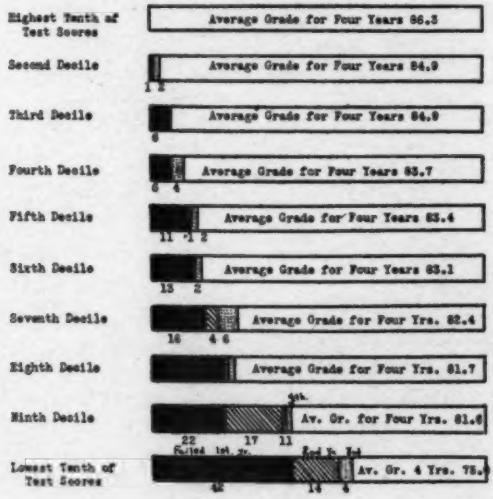
Volume 11 SEPTEMBER, 1936 Number 5

Report of the Committee on Aptitude Tests For Medical Schools

F. A. Moss
Director of Study
Washington, D. C.

The work of the Committee on Aptitude Tests has progressed to the point where it has been possible to follow two whole classes through four years of medical work, a year's internship and the standing of the gradu-

FIG. 1. MEDICAL SCHOOL PERFORMANCE AT VARIOUS TEST SCORE LEVELS.
(Graduates of 1932)



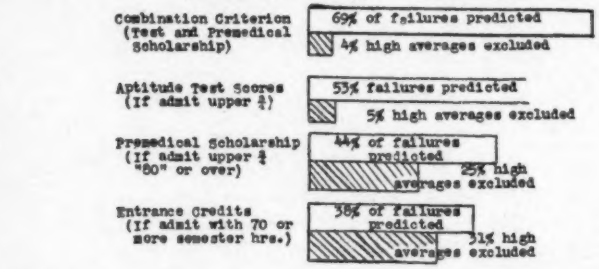
ates on the National Board of Medical Examiners and various state board examinations. The following charts will summarize briefly how well the aptitude test has predicted the performance of these students in medical school, as interns and as competitors for license.

I. Prediction of four year medical school grades by the aptitude test.

(1) *Graduates of June, 1932:* This analysis includes approximately 1,000 students in fourteen medical schools who took the aptitude test in the school year 1928-1929. The schools in which students were tested in this first year of experimental work include: Baylor, Boston, Cincinnati, Creighton, Dartmouth, George Washington, Hahnemann, Meharry, Minnesota, Syracuse, Temple, Tennessee, Western Reserve and Woman's Medical College.

Figure 1 shows how well the test predicted the success of these students over the four year medical school course. The students were divided into ten equal groups on the basis of their scores on the aptitude test. Each bar shows the percentage of failures occurring in the four years and the average grades of the group. It is of interest to note that in the highest tenth no man has failed in any of the four years of the medical school course, and

Fig. 2. Efficiency of Various Criteria for Selecting Medical Students. (Standard in all: upper three-fourths).


Combination Criterion (Test and Premedical Scholarship)
69% of failures predicted
4% high averages excluded
Aptitude Test Scores (If admit upper ¾)
53% failures predicted
5% high averages excluded
Premedical Scholarship (If admit upper ¾ "80" or over)
44% of failures predicted
25% high averages excluded
Entrance Credits (If admit with 70 or more semester hrs.)
38% of failures predicted
21% high averages excluded

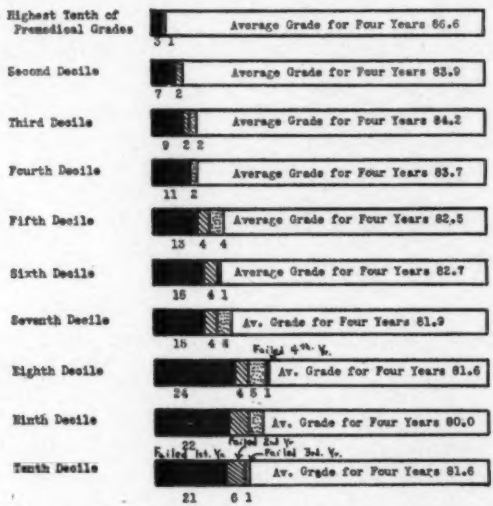
the group shows an average grade for the four years of over 86, an exceptionally high average.[1] Eleven per cent of this group graduated with final medical school averages of 90 or higher. On the other hand, at the end of the medical course, 60 out of 100 failed in the lowest tenth, and the final average for this whole tenth is only 75.0, just barely passing. None show an average as high as 90, and the majority of those who graduated show low grades and failures in some course during the four years.

For most of the groups of tenths of test scores on this chart, the average medical school grade is slightly higher than for the corresponding tenth at the end of three years' work. This only signifies that medical school students receive higher grades as seniors than as lower classmen.

1. It should be remembered that these tests were administered under ideal conditions to students already in medical school, and it is not surprising that when the tests are administered in more than 600 arts colleges we occasionally have failures of students who are in the upper decile of the test scores. This discrepancy may be due to several factors, but is most often due to poor proctoring of the test.

Based on the distribution of medical school work over the four-year course of these 1,000 students, we may say that: If a student has a score as high as the upper tenth tested: (1) the chances are 100 per cent that he will graduate from the medical school; (2) and the chances are 3 to 1 that he will average 85 or over for the whole four years. On the other hand, if he is as low as the lowest tenth tested: (1) the chances are 60 out of 100 that he will not be able to graduate because of failure to carry the work satisfactorily; (2) and the chances are 9 to 1 that he will have an average below 85 if he does graduate; (3) or 2 to 1 that he will have an average below 80.

FIG. 3. MEDICAL SCHOOL PERFORMANCE FOR VARIOUS PREMEDICAL AVERAGES. (Graduates of 1932)



Comparative Study of Three Commonly Used Criteria: The Committee has been interested from the beginning of its work in studying the predictive value of certain other criteria which are now generally used in the selection of medical students. As we have stated repeatedly, we do not desire to replace any criteria of proven value with the aptitude tests; but we urge the careful selection of a battery of criteria which will supplement one another. Let us consider the relative efficiency of the various criteria and certain combined criteria as shown on one thousand students.

For the 1,000 students graduating in June, 1932, we know the test scores, their premedical scholarship, and the number of semester hours

entrance credits. A comparison of these factors has been made with respect to their value as criteria in predicting failures occurring throughout the four years.[2] Another factor often given consideration is the personal interview rating. This we have omitted in this report because of its unavailability, except in a few individual schools.

Figure 2 shows the relative advantages of the four criteria indicated. The predictions of percentage of failures refer to percentages of the actual failures which occurred in this group throughout their four years. The percentage of good students excluded is indicated since it is obvious that any criterion that is used to eliminate failures must be one which excludes as few good students as possible. These figures cannot, of course, consider any possible good students eliminated by the standards now in use (as "passing" premedical grades or 60 semester hours of admission credits). Since students falling below these standards were not admitted, there was no chance to find out anything about them so far as medical school performance is concerned. It is quite possible, for example, that some who were refused admission because of low premedical grades would have been able to carry the medical course successfully if admitted.

For the one of these criteria which we have been comparing with the aptitude test that is usually considered most valuable in differentiating applicants, we have also studied the four year medical school averages according to tenths of students, as was done for the test scores in Figure 1. Figure 3 shows the distribution of four-year medical grades for different premedical averages. The students are divided into ten equal groups on the basis of their premedical averages. The first bar represents the highest

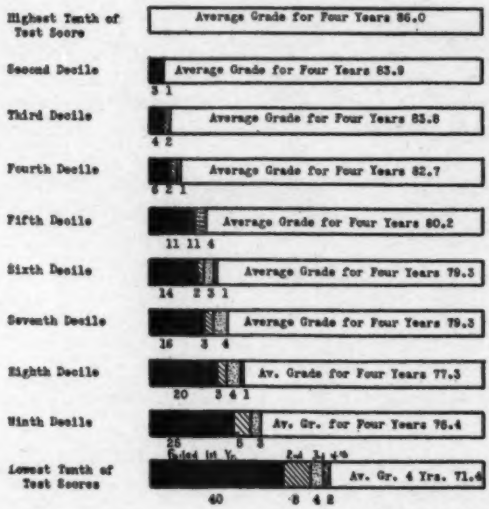
---

2. In figuring the deciles for both the premedical grades and for the test scores, we always used the relative standing of the students admitted to a given medical school for we were trying to predict their grades in that specific medical school. It might happen that the average percentile in medical school X would be 75 while the average percentile in medical school Y would be only 25, these percentile figures being based on the grades of all students in America taking the test. Such being the case, it is obvious that a man with a 50 percentile might be the lowest of the whole class in medical school X and might be the highest of his class in medical school Y. Consequently, he would very likely fail in medical school X and make a good grade in Y. In preparing for correlations, therefore, we always arrange the students according to their scores in their own school. In other words, if a student who made a test score of 186 on Form 5, and thus has a 50 percentile score in relation to all the students who took this test, is admitted to a class of 100 students in school X where his score is lowest of all those admitted to his class, he would automatically become the 1 percentile, whereas if he were admitted to a class of 100 students in Y where his score was highest he would automatically become the 100 percentile. (It should be understood, of course, that the difference between medical schools is not as extreme as would appear from this illustration.)

From a statistical standpoint, there is an additional reason for grouping each school's students according to their percentile in that particular school, namely that it gives you a much more adequate spread or distribution of the students. For example, if in school A three-fourths of the class come in the 6th decile and the other fourth in the 5th and 7th deciles, it is obvious that the group is so homogeneous that it would be more or less useless for correlation purposes. In other words, the original percentile is too coarse a measurement for this group. It would be more or less equivalent to grouping the heights of men in terms of feet and disregarding the inches. We might make a rough correlation between height and weight of men dividing the men according to height into three groups, 4-5 ft., 5-6 ft., 6-7 ft., but it is obvious that we would get a much more accurate correlation if we arranged the heights in inch intervals instead of foot intervals and correlated it against the weight.

tenth of students in their premedical work; the second bar the next to the highest tenth, and so on to the last bar which represents the lowest tenth in premedical grades. It can be seen that there is a definitely positive relation between premedical grades and success in the four years of medical school work, there being a definite tendency for those with high premedical records to do better medical school work than those with low premedical records. However, this chart should be contrasted with Figure 1 in which the same students are divided into tenths on the basis of their test scores.

FIG. 4. MEDICAL SCHOOL PERFORMANCE AT VARIOUS TEST SCORE LEVELS. (Graduates of 1933)


Highest Tenth of Test Score
Average Grade for Four Years 86.0
Second Decile
Average Grade for Four Years 83.9
3 1
Third Decile
Average Grade for Four Years 83.8
4 2
Fourth Decile
Average Grade for Four Years 82.7
6 2 1
Fifth Decile
Average Grade for Four Years 80.2
11 11 4
Sixth Decile
Average Grade for Four Years 79.3
14 2 3 1
Seventh Decile
Average Grade for Four Years 78.3
16 3 4
Eighth Decile
Av. Grade for Four Years 77.3
20 3 4 1
Ninth Decile
Av. Gr. for Four Years 76.4
25 6 2
Failed 1st Yr. 2nd 3rd 4th
Lowest Tenth of Test Scores
Av. Gr. 4 Yrs. 71.6
40 8 4 2

The failures predicted by the lowest tenth of test scores constitute 60 per cent of the group; those predicted by the lowest tenth of premedical grades only 28 per cent, and this could be effected in fact only if we raised premedical scholarship requirements above what they are, and as we have already pointed out the number of good students excluded would make this a questionable procedure. It is also interesting to note that the eighth and ninth decile groups of premedical grades show a larger number of failures than does the lowest tenth.

(2) *Graduates of June, 1933:* Approximately 500 students in the class of 1933 were also tested experimentally after they had entered medical school. How the grades on this test predicted attainment in the four year medical school course is shown in Figure 4.

II. Prediction of success as interns

Thus it will be seen that in each of these classes the test has a fairly high predictive value of performance of students in medical school. We next wished to determine, in so far as possible, the relationship between

Fig. 5. Relationship Between Aptitude Test Scores and Ratings as Interns. (Graduates, June, 1932)

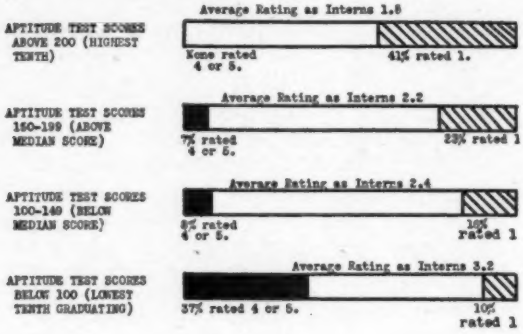
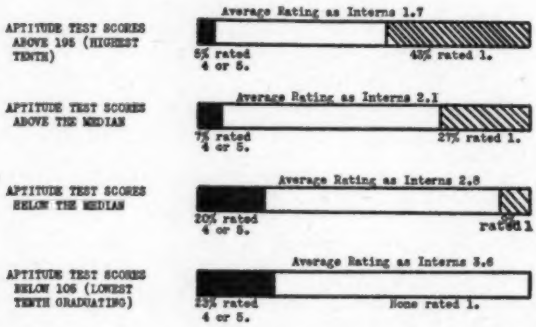

APTITUDE TEST SCORES ABOVE 200 (HIGHEST TENTH)
Average Rating as Interns 1.8
None rated 4 or 5.
41% rated 1.
APTITUDE TEST SCORES 150-199 (ABOVE MEDIAN SCORE)
Average Rating as Interns 2.2
7% rated 4 or 5.
23% rated 1
APTITUDE TEST SCORES 100-149 (BELOW MEDIAN SCORE)
Average Rating as Interns 2.4
8% rated 4 or 5.
10% rated 1
APTITUDE TEST SCORES BELOW 100 (LOWEST TENTH GRADUATING)
Average Rating as Interns 3.2
37% rated 4 or 5.
10% rated 1

Fig. 6. Relationship Between Aptitude Test Scores and Ratings as Interns. (Graduates, June, 1933)


APTITUDE TEST SCORES ABOVE 195 (HIGHEST TENTH)
Average Rating as Interns 1.7
8% rated 4 or 5.
43% rated 1.
APTITUDE TEST SCORES ABOVE THE MEDIAN
Average Rating as Interns 2.1
7% rated 4 or 5.
21% rated 1.
APTITUDE TEST SCORES BELOW THE MEDIAN
Average Rating as Interns 2.8
20% rated 4 or 5.
rated 1
APTITUDE TEST SCORES BELOW 105 (LOWEST TENTH GRADUATING)
Average Rating as Interns 3.6
23% rated 4 or 5.
None rated 1.

the test scores and the performance of the students as interns. In making this investigation, we selected hospitals having three or more interns who had taken the test. Each intern was rated by the superintendent or physician in charge of his work and the ratings were based solely on the performance of duties as interns.

The relation between the aptitude test scores and the ratings as interns is shown in Figures 5 and 6.

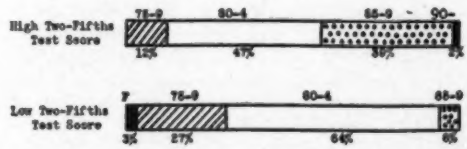
The ratings were made on a scale of 1 to 5; "1" being the highest rating and "5" the lowest. The interpretations of these ratings as given to the rater are as follows:

"1" comes up to the best intern the hospital has had.
"2" is good, above average, but not equal to the best intern.
"3" is equal to the average intern hospital has had.
"4" is below the average intern, but better than the poorest the hospital has had.
"5" is among the poorest interns the hospital has has had.

Thus, it would appear that the test not only predicts performance in the medical school, but gives considerable indication of how efficient the student will be as an intern.

III. Prediction of performance in national and state board examinations

Fig. 7. Relationship Between Aptitude Test Scores and Performance on New York Board Examinations.



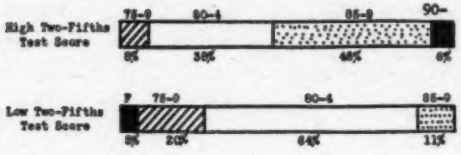
249 Graduates of New York Schools took Form 2 as Freshmen, 1929-1930: 62 New York University, 70 Long Island Medical College, 11 Albany Medical College, 11 University of Rochester, 43 New York Homeopathic Medical College, 20 Columbia University, 32 University of Buffalo.

Having followed the students through the medical course and their internships, our next concern was to see how well they stood in state and National Board Examinations. In order to do this, we succeeded in getting from the National Board of Medical Examiners the grades made by the different men on that test, and we also secured from the following state boards,—District of Columbia, Maryland, Virginia, New York, and Pennsylvania—, the state board ratings of the graduates of 1932 and of 1933 who had taken the aptitude test. In as much as each state has a different grading system, it was thought best to present the results sepa-

rately. As an indication of how well this test predicted the board grades, we will take the performance of students from the two states having the largest number of cases, namely New York and Pennsylvania. The charts are self explanatory.

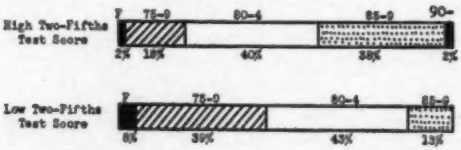
FIG. 8. RELATIONSHIP BETWEEN APTITUDE TEST SCORES AND PERFORMANCE ON PENNSYLVANIA BOARD EXAMINATIONS.

(Graduates of 1932).



115 Graduates of Pennsylvania Schools took Form 1 as Freshmen, 1928-1929: 5 Woman's Medical College, 59 Hahnemann Medical College, 51 Temple University.

(Graduates of 1933).



151 Graduates of Pennsylvania Schools took Form 2 as Freshmen, 1929-1930: 5 Woman's Medical College, 48 University of Pittsburgh, 62 Jefferson Medical College, 36 Hahnemann Medical College.

National Board of Medical Examiners: Included in our studies are all those graduates from medical schools for the years 1932 and 1933 who have taken both the medical aptitude test and either one or two parts of the National Board examination. The aptitude test records were available on approximately 1,000 students graduating in 1932, and on approximately 5,000 graduating in 1933.

It is of interest, and of some importance, in the interpretation of the results of the present study to note the selectivity of the students who have taken the National Board examinations. A large percentage of those who have taken this examination fall in the upper levels of aptitude test score. An average for the two years studied shows 76 per cent of those taking National Board examinations in the upper half of ability as measured by the aptitude test; and only 1.5 per cent in the lowest decile of test scores.

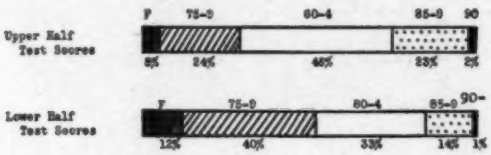
This is due, in part, of course, but not entirely, to the fact that a larger percentage of the students in the lower half have failed in medical schools before graduation. But aside from this, there seems to be a definite tendency for the student of relatively high ability to be found taking the National Board examination. These generalizations do not include those schools requiring that all students take the examination.

TABLE 1. DISTRIBUTION OF TEST RECORDS OF THOSE TAKING NATIONAL BOARD EXAMINATIONS

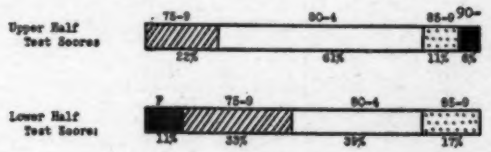
	1932 Graduates	1933 Graduates
Above average test score	86%	65%
Below average test score	14%	35%
Highest decile test score	36%	15%
Lowest decile test score	0%	3%

FIG. 9. RELATIONSHIP BETWEEN APTITUDE TEST SCORES AND PERFORMANCE ON NATIONAL BOARD EXAMINATIONS.

(Graduates of 1933—Part I, National Board).



(Graduates of 1932—Part II, National Board).



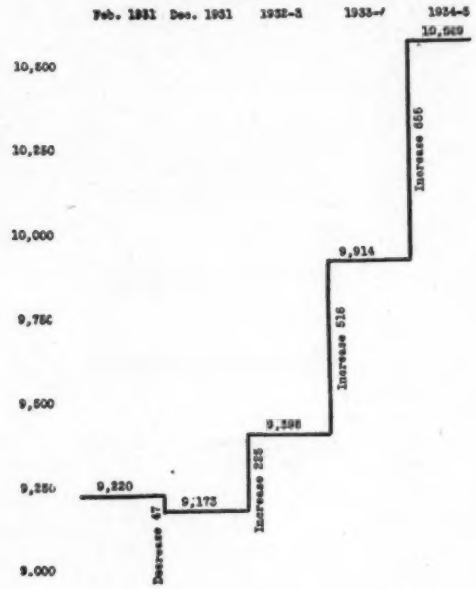
The Test of December 7, 1934: During the fiscal year 1934-1935, 10,569 tests were given in 617 premedical colleges: 56 from September 1, 1934, to December 6, 1934; 10,227 between December 7, 1934, and January 28, 1935; and 286 since January 28, 1935.

The new form of the test (Form 7) administered on December 7, 1934, consists of the following parts: (1) Comprehension and Retention; (2) Visual Memory; (3) Memory for Content; (4) Spelling; (5) Logical Reasoning; (6) Scientific Vocabulary, and (7) Understanding of Printed Material. The total scores made ranged from 22 to 286. The

median total score was 154, one-half of those taking the test falling above this, and one-half below. The highst quarter made above 179; the lowest quarter below 126.

On January 28, 1935, we forwarded to the admission officers of the medical schools a report of the ratings of the students tested on December 7, 1934. As a result of suggestions made by some of the deans, several changes had been made in the arrangement and content of the volume.

FIG. 10. NUMBER OF MEDICAL APTITUDE TESTS GIVEN (Feb. 1931—Aug. 1935).



It had been suggested that in the case of some of the smaller schools the name of the city in which it is located is often not readily recalled. For that reason the schools were arranged by states and then alphabetically within the states rather than alphabetically by cities within the states and then by schools. An index was placed at the end of the volume in which all the schools were listed alphabetically with page numbers.

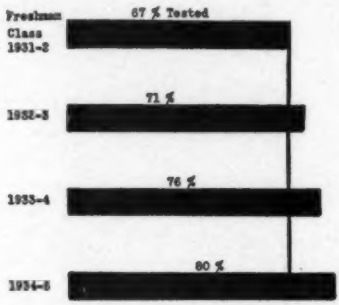
In addition to these sections, the 1935 report included: (1) A brief analysis of the separate parts of the test pointing out the different mental processes which we had hoped to tap with each test; (2) a discussion of

the use of the separate tests in vocational guidance prepared by the personnel officer of one of the leading universities; (3) tables for interpreting the test results: Decile Tables for each of the separate tests, a correction for students who had taken the test before, and a correction table for raising the percentile of two year students.

During the five years that the test has been administered by the Association of American Medical Colleges, 48,274 tests* have been administered. The number of tests given each year is shown in Figure 10. It will be noted that with the exception of 1931, when there was a decrease of 47 tests or 0.5 per cent, the number of tests given from year to year has steadily increased. For the past fiscal year (1934-1935) there was an increase of 6.6 per cent over the previous year.

PERCENTAGE OF STUDENTS ADMITTED WHO HAVE TAKEN THE TEST:

FIG. 11. PERCENTAGE OF FRESHMAN CLASSES HAVING APTITUDE TEST SCORES.



With the increase in the number of tests given from year to year, there has been a corresponding increase in the percentage of the freshmen class having test scores. It will be noted in Figure 11 that 67 per cent of the students admitted to medical school in the fall of 1931 had taken the test, while 80 per cent of the 1934-1935 freshman class had been tested. Of the 76 approved medical schools, fifty showed an increase in the percentage of their 1934-1935 freshman class tested as compared with the 1933-1934 class. In five schools the percentage was unchanged, and in fourteen of the remaining twenty-one schools there was a decrease of five percentage points or less. In twenty-four of the seventy-six schools 90 per cent or more of the class had been tested, and one school showed 100 per cent. Figures are not yet available for the present freshman class (1935-1936), but indications are that there is a further increase.

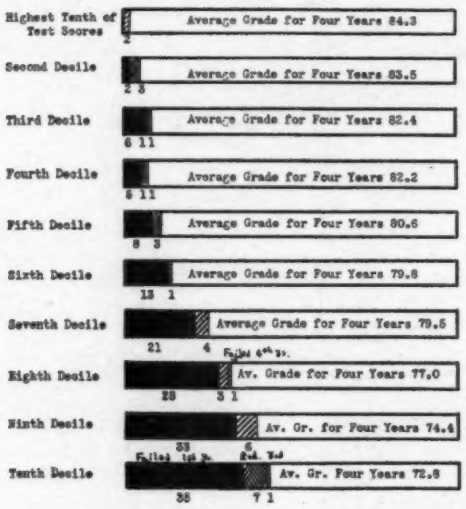
*This figure does not include tests given since Sept. 1, 1935.

PREDICTION OF MEDICAL SCHOOL GRADES (CURRENT CLASSES)

Graduates of June, 1935: Those students who took the medical aptitude test the first year the Association undertook to apply it to applicants in the premedical colleges before admission to medical schools, graduated in June, 1935, and we are now able to compare their scholastic records for the four years with their test scores.

Figure 12 shows how well the test predicted the success of these students over the four year medical school course. The students had been divided into deciles on the basis of their test rating. Each bar shows the

FIG. 12. MEDICAL SCHOOL PERFORMANCE AT VARIOUS TEST SCORE LEVELS SENIORS, 1934-1935.



percentage of failures occurring in each of the four years and the average grade of the group. In the highest tenth only 2 per cent have failed (these failures occurred in the second year) and the average grade for the group is 84. Four per cent of this group graduated with final medical school averages of 90 or higher, and 56 per cent have averages above 85. On the other hand, at the end of the medical course, forty-three out of 100 failed in the lowest tenth, the final average for the group being below passing (73). None show an average as high as 90, and the majority of those who graduated have failures in some subjects.

FIG. 13. MEDICAL SCHOOL PERFORMANCE AT VARIOUS TEST SCORE LEVELS JUNIORS, 1934-1935.

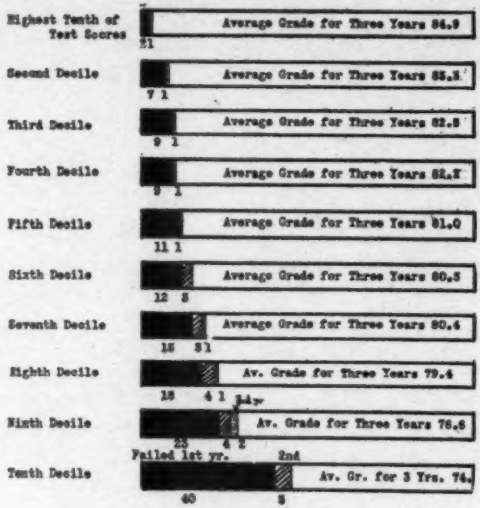
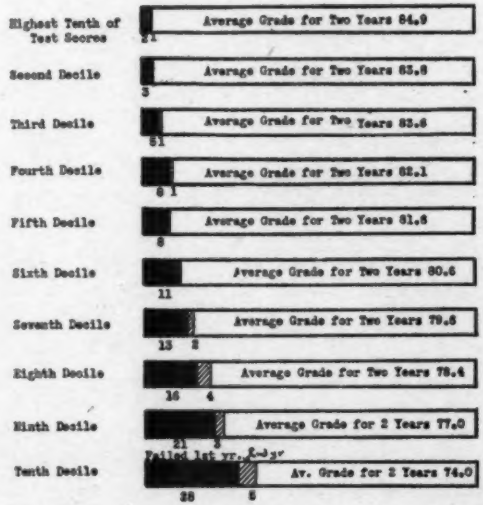


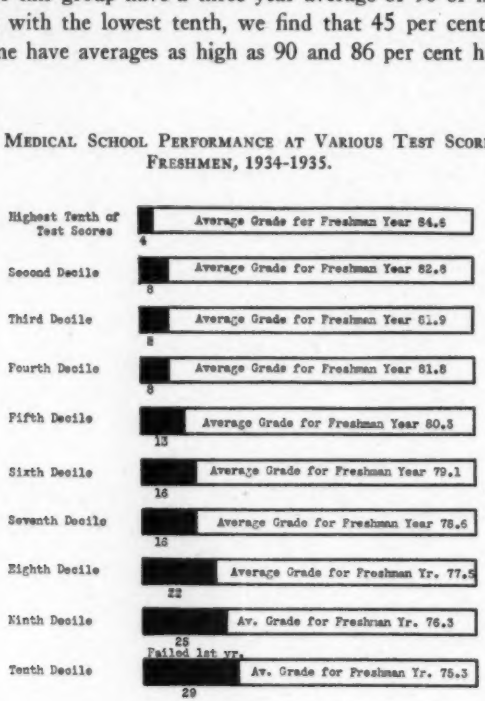
FIG. 14. MEDICAL SCHOOL PERFORMANCE AT VARIOUS TEST SCORE LEVELS SOPHOMORES, 1934-1935.



Juniors, 1934-1935: These students took Form 4 of the test in December, 1931. The relation between grades (three year average) and test scores for the group is shown in Figure 13.

The interpretation is identical to that for the seniors. Each bar shows the medical school grades during three years for one-tenth of the group. For example, in the highest tenth, there are only 3 per cent failures and 9 per cent of this group have a three year average of 90 or higher. Contrasting this with the lowest tenth, we find that 45 per cent have failed so far. None have averages as high as 90 and 86 per cent have averages below 85.

FIG. 15. MEDICAL SCHOOL PERFORMANCE AT VARIOUS TEST SCORE LEVELS FRESHMEN, 1934-1935.



Sophomores and Freshmen, 1934-1935: In Figures 14 and 15 we present the attainments of various tenths of test scores for last year's sophomore and freshman classes. These charts of prediction of medical school work are similar to the charts of the seniors and juniors. In each class, the average grade in medical school shows a gradual decline from the highest tenth of test scores to the lowest tenth, and in every instance the percentage of failure increases markedly as test score decreases. It is noted, however, that there is a slightly lower percentage of failures for these two groups than for the seniors and juniors.

Teaching of Histology

E. V. Cowdry
Professor of Cytology, Washington University School of Medicine
St. Louis, Missouri

How best to teach the histology, or microscopic anatomy of the human body, is a major problem in medical education. There are many reasons why we may expect, in the next few years, changes far more radical than those which followed the publication of Flexner's classical survey. Progressive socialization in the practice of medicine, whatever form it may take, will probably modify established conditions of medical education as well. The oft-repeated suggestion that medical schools should absorb two years of premedical instruction and offer a coordinated medical curriculum of six years instead of four, as the British are doing, if followed, will lead to extensive reorganization. The hands at the helm are changing. Richard Pearce is no longer with us, but his great work lives on and will be remembered. Flexner's survey was made under the auspices of the Carnegie Foundation. The General Education Board, operating in the United States, and the Rockefeller Foundation, with no national limits, have both played important parts and have encouraged universities and governments everywhere to help themselves. The Rockefeller Foundation is now, however, concentrating on research projects and sharply limiting its work in medical education to public health and psychiatry. But many other organizations are entering the field. The survey now being conducted by the Council on Medical Education and Hospitals of the American Medical Association, the Association of American Medical Colleges and the Federation of State Medical Boards will lead to the enunciation of policies which may be unexpected. To read current numbers of the Journal of the Association of American Medical Colleges is to find how potent are the ferments at work.

It is important for histologists to follow the example so abundantly set by others, to take stock of the situation, to come forward and express their views. These will vary depending on their individual experience and the opportunities, or lack of them, which they have in their own particular academic environments. The impetus to change is irresistable and now is the time to change. I believe that the teaching of histology has not improved as fast as has the teaching of others of the preclinical sciences; further, that the course is static and fixed, just as we tend to use too much fixed and dead material. To bring ourselves abreast of the high standards attained by others demands thought and hard, constructive labor over a period of years. Results will not be achieved simply by waving a wand

and murmuring the magic word "cooperation." Temperance is necessary in all things. Cooperation is all right up to a certain point. If pushed too far, it may become a plague. The following suggestions are advanced:

1. *That the course be made more experimental.* At present, the students grow weary because they are expected to sit quietly on hard stools and examine sections of tissues hour after hour. Too often they are supposed to acquire a knowledge of histology by listening to lectures, by reading and by seeing what they are told to look for. In hardly any other subject is there so much patient sitting around and so little actual doing. Most histological laboratories are built for this, the old style histology. The lighting is usually good, but the students have insufficient elbow room and facilities for experiments are conspicuous by their absence. Instructors say that experiments would consume too much time anyway; but they are thinking of their own time and forget that their colleagues in other departments now employ the experimental approach as a matter of course. Students must be spared the routine preparation of histologic specimens, which later on will probably always be made for them; but some of the more quickly applied techniques they should learn, particularly those used in making blood examinations.

The experiments may be divided into three groups: (1) performed by the entire class; (2) by only a few students working, perhaps, in pairs, and (3) by the instructors, with students acting as assistants. The students should not be told exactly what they will find but should be encouraged to approach each problem as investigators seeking the truth by experimental means—a point of view, which, once acquired, should grow into a habit.

All members of the class, working with their own blood, can ascertain for themselves the effects of hypertonic and hypotonic salt solutions, of changes in hydrogen-ion concentration and of temperature. They can study the movements of leucocytes, apply the oxydase reaction and use supravital stains. By careful examination of sections of their own skin made with a razor blade, parallel to the surface and deeper and deeper, they will discover many useful facts in ways they will remember. This by no means exhausts the list of possibilities. It is merely an indication.

To discover the influence of postmortem degeneration, two students, working together, might remove a piece of pancreas and a parathyroid from a freshly killed animal and fix the tissues immediately. A day later they could take similar samples. The class technician would prepare the slides, explaining the technique, and the students would describe the results. In order to ascertain the difference between an artery full of blood *in vivo* and one collapsed after blood has left it at autopsy, the necessary

specimens should be collected by another pair of students, sections made and stained by the technician and examined critically by the students. Another experiment should illustrate the difference in structure of the spleen *in vivo* and at autopsy. Two students, also with the aid of an instructor, should collect blood, citrate, centrifuge and report on structural components found at different levels examined in the fresh state. One of two students might do without breakfast while his partner took a pint of cream just before coming to the histological laboratory. A little help with a dark field outfit would enable them to make an interesting comparison of their peripheral blood. The number of such experiments would depend on the enthusiasm and resourcefulness of the instructor. The objection, that this would prevent all the students from trying to do exactly the same thing at the same time is not valid. Lockstep courses hold back the good students. But there must be a basic organization in the presentation of the course on which experiments would be superposed at appropriate times. Before the end of the course, each pair of students would have performed two or more experiments.

More difficult experiments, carried out by the instructor with student aid, would have the force of special demonstrations for the whole class. Many of these suggest themselves: glycogen storage in the liver revealed by Best's carmine; effect of atropine and pilocarpine on secretion antecedants in acinous cells of the pancreas; response to benign and irritating substances by loose connective tissues, etc. Special techniques of value in experiments should also be exhibited. Ability to do so will depend on the diversity of research in the department and in the school. The Knisely method of transillumination of the spleen *in vivo,* the Sandison-Clark technique of studying ingrowing vessels in transparent chambers inserted into rabbits' ears, micro-dissection, micro-incineration, Covell's method for detailed investigation of secretary processes in the living pancreas, and many others would prove interesting. It is not intended that histology should cease to be chiefly morphological but that form should be linked with function, for the two are really inseparable.

2. *That a collection of permanent specimens be loaned to the students for the entire four years of the medical course.* This should include: (1) Standard human tissues obtained preferably from executions; (2) specimens of human tissues selected to illustrate the normal range in structure with age and with degree of physiological activity; for instance: striated muscle, aorta and kidneys of children, adults and senile individuals; resting and lactating mammary glands, proliferating and menstruating uteri, relaxed and contracted muscle, etc.; (3) preparations showing relation between form and function derived from simple experiments with animals. The collection should not be handed back to the histological department

at the end of the course in histology but should be retained by the students to serve as a basis for subsequent work, particularly in pathology. The opportunities for correlation between histology and pathology have been eloquently expressed by Macklin. A pathological loan collection added to the histological collection would provide for a steadily increasing acquaintance with the minute anatomy of the human body in disease as well as health, without which, studies in biochemistry and physiology, however carefully made, will be vague and unrelated to architectural realities.

3. *That the subject matter of the course in histology be adjusted to conform with advances made in the clinical sciences.* In the past, there has been a tendency to teach histology for itself alone only those subjects being stressed that are thought to be of fundamental importance, interest the instructor or are easily presented. Emphasis must be shifted. At present there are many inconsistencies. Textbooks of histology devote more space to hair and finger nails than they do to the neutrophile leucocytes. Radial arteries, which students will palpate as long as they are in practice, are for some reason never illustrated. A good method would be to submit in detail the content of several courses in histology given in leading schools to a group of instructors in the clinical branches for suggestions. They would enter into the spirit of the plan and gladly help. In addition, the students would profit and even be thrilled if occasionally a patient were exhibited in the histological laboratory. For instance, a case of acromegaly at the time that they are working on the pituitary. But this should be done as a treat, not as a routine procedure.

4. *That the time of presentation of histology be correlated as much as possible with that of gross anatomy.* There are, however, several difficulties. Gross anatomy is a considerably longer course than histology. Much time is devoted to the dissection of the extremities concerning which histology would have comparatively little to offer. The blood is not taken up in gross anatomy, whereas a great deal of attention is paid to it in histology. The study of the brain, often poorly preserved, is quite brief in gross anatomy, while weeks must be devoted to it in neurology, which with us, as in most institutions, is given as a part of histology, though a special textbook of neurology is always required. Nevertheless, three suggestions may be advanced: (1) When the plan is to dissect the extremities first, the histological course might be postponed and run synchronously with work on the head and neck, thorax and abdomen. (2) Special dissections, corrosion and maceration specimens, might be displayed in the histological laboratory while the minute anatomy of similar parts is being studied. (3) Instructors in histology might occasionally take the place of those in gross anatomy, and vice versa.

To go further and divide the course in histology into systems, with the intention that these should be presented at the time that the student learns about the gross anatomy, biochemistry, physiology and pathology of the same systems would have certain advantages and less evident but serious drawbacks. It would interfere with orderly instruction in these main subjects as units. To consider any one of these systems, in this correlated fashion, would not be feasible except on the basis of rather comprehensive information about all the others. Thus, a correlated account of the blood would be narrow, indeed, without repeated reference to the digestive, urinary and many other systems. It is important for a grounding in histology, gross anatomy and biochemistry to precede physiology and pathology.

5. *That the course in histology be organized in accordance with some definite plan.* The emphasis on experiments, the provision for continuity onward with later courses, the adjustment of subject matter to new needs in the clinical branches and the correlation with gross anatomy will interrupt, in a healthy way, the even tenor of the course as ordinarily given. If the course is well organized, the actual order of presentation of material makes little difference. Instructors must have a large measure of freedom to follow their own judgment. Otherwise much of the pleasure in giving the course will be lost and performance will suffer.

It is logical to start with the skin and then to follow, as was done in a book on special cytology prepared by many writers. By this method, at the very beginning of work in the school of medicine, the students study intensively the barrier between the living tissues of the organism within and its environment without. It is biologically sound to emphasize and continue to emphasize the adjustments effected through skin and sense organs. The entire microscopic structure of the body, and the chemical organization which this makes possible, are arranged to provide, on the one hand, for such adjustments and by the same token for the maintenance of stability in the internal fluid environment. Both are fundamental to medicine in a broad sense, but psychiatrists stress the first, and physiologists, led by Cannon and Barcroft, the second.

Perhaps, a better way is to end up with the skin and to start with the blood, because freshly drawn blood can be mounted and the cells examined in the plasma in which they normally function, and construct the whole course about the blood vascular system as the principal means of integration. The lymphatics would follow, as the mechanism of absorptive drainage into the blood; likewise the endocrines, which pour their products into the blood stream. The digestive system, which provides for assimilation and some excretion, might come next; then, the respiratory

system, permitting oxygen consumption and carbon dioxide elimination; and the urinary system that removes waste and regulates the constitution of the blood. It is convenient, then, to shift to rapid neural integration by the nervous system, to architectural support and muscular movement, to the reproductive system and to conclude with the skin which unifies, protects and adjusts.

One difficulty in planning a course in histology—as in arranging the whole medical curriculum to the best advantage—is to decide what is most important. Quite naturally no two histologists and no two medical deans will think exactly alike. But, having reached some sort of compromise, the next step is to agree on what to leave out or to treat lightly. Here, again, there will be marked differences of opinion. But that much must be omitted is evident. Histologists are to blame for not recognizing this fact. It is partly because we have attempted to cover evenly the microscopic anatomy of the whole body that some parts of the subject are dull and uninteresting. The other reason has been stressed, namely, that morphology has been unrelieved by experiment. Physiologists have been wiser. They make no effort to cover all bodily functions. They stress muscle and nerve, circulation, assimilation, excretion and several other main attributes which can be presented well by experiments. It is even possible that this effective elimination and concentration is by them carried a little too far. We want more, rather than less, physiology. On the principle that it is advantageous to closely link structure and function, two special ways of reducing the subject matter in histology, in order that the more important topics may be better presented, suggest themselves.

The account of cells as elementary vital units, with which most courses begin, should be limited to the particular types of cells first encountered —epidermal cells, blood cells or whatever they may happen to be. To devote much time to a study of cells in general is contraindicated, because an intelligent appreciation of their structure and function can only be obtained when they are studied in the environments in which they serve—liver, pancreas, spleen, etc. To discuss hepatic, pancreatic or splenic cells weeks before the said organs are examined is to separate widely structure and function.

The same is true in respect to the so-called elementary tissues. The common method is to offer instruction about them after a general account of cells and before the organs are treated. But to ask the students to examine simple columnar epithelium, ciliated epithelium, stratified squamous epithelium and all the other varieties of epithelium in many preparations, ignoring for the time being other architectural features of the organs and systems in which these occur, is illogical. The structure of

the various kinds of epithelium can only be appreciated when viewed in relation to the particular environments in which they exist and the special functions they serve. Dislocation should be replaced by articulation.

By concentrating attention on systems and organs a much more direct association of structure and function is achieved. Coming thus to know, in a constructive manner, the cells and elementary tissues in their natural surroundings brings a more realistic conception of their nature and adaptability, and valuable time is saved. To facilitate this direct approach some preliminary training is desirable.

6. *That prerequisites for histology be established.* Biochemists and physiologists have rightly insisted on exacting preliminary work in various branches of physics, inorganic and organic chemistry, quantitative and qualitative analyses, and so on. Histologists have, as a rule, been silent. The former have been riding on the crest of the wave of conviction that advances in medicine will come principally through life giving contact with physics and chemistry. The latter have been branded as simple minded morphologists whose needs are almost negligible—a microscope, a few chemicals, as much alcohol as they want, a good sharp knife and plenty of time for meditation! The medical and surgical specialties have grown vigorously and some (allergy) have actually been born since the preclinical departments became frozen by congestion. Such additions to the superstructure create temptations to modify the first two years so that the burden can be carried better. Now, appears a strong cross current of opinion that matters concerned with personality and human adjustment have been consistently neglected and must be provided for. It is in this general situation that we must consider histological prerequisites. Two are, in my opinion, desirable.

The first is a course in embryology. There is little agreement as to the place of embryology in the medical curriculum though all are agreed that this subject gives the student an essential perspective in the interpretation of adult conditions. A superficial analysis of the situation shows embryology: (1) as a prerequisite for entrance; (2) recommended to premedical students but not required; (3) as taught in schools of medicine somewhat incidentally in histology, gross anatomy and more or less in obstetrics, and (4) as given in the form of a definite laboratory course and an important item in the medical curriculum. We are not looking for autocratic standardization. Histologists must do their best in the conditions to which they have been called. Medical students labor under too much pressure, particularly in the first two years, so that it would seem to be the part of wisdom to arrange for them to take embryology as a prerequisite before they enter the medical school.

Others may think differently. Included in departments of anatomy are many leading embryologists. These may wish to teach embryology. I am not unforgetful, in this connection, of the old days at Hopkins. Dr. Mall was a great embryologist and certainly appreciated the value to medical students of a knowledge of development of the human body. He had an unrivalled collection of embryos at hand which could have been used for teaching purposes. Yet, a formal course in embryology was not offered in the department, neither was embryology required as a prerequisite, nor was the course in histology made longer than usual in order to include much embryology. The instructors, however, often explained adult conditions by reference to embryological ones, as happens wherever histology is well taught. I believe that the same conditions prevail at Hopkins today.

Some may, nevertheless, hesitate to make embryology a prerequisite because they are convinced that it can be presented better in the medical school. This conclusion is not altogether warranted. Embryologists of note are not restricted to schools of medicine. Many of them are in departments of zoology and biology and some of these university departments are already offering the kind of instruction in embryology that the medical faculties insist on having, though the majority are not. This is not the place to try to specify the content. Obviously, a course primarily for graduate students intending to take a master's degree and teach in some high school, or a doctor's degree and continue in some branch of biology, would not be satisfactory. It would have to be shaped on consultation with histologists, gross anatomists and obstetricians, all of whom would aid in the collection of the necessary material. University departments of chemistry and physics regularly offer courses adapted to the needs of engineers. We may anticipate that those of zoology and biology will likewise cooperate with schools of medicine once the need is made clear.

There is another point, we should not make demands for embryology which consider the welfare of the part before the whole, of a single course before the whole training in medicine. Everything that is desirable cannot be forced into the first year, which is the logical place for embryology if it is to be given in the medical school. We must decide what is most needed of a number of subjects. A good case has been made out by Adolf Meyer for the inclusion of psychobiology not only in the first year but throughout the four years of the medical course. Psychobiology, in contrast to embryology, cannot be presented as a prerequisite. It would not consume as much of the first year student's time as embryology. It is mentioned simply as an example of a worth while addition. Other subjects may be advocated with equal justification. We should maintain a little leeway.

If embryology is actually rated as a prerequisite, a conception of the remarkable and interesting phenomena of development would unfold gradually in the minds of the students. The beginning, before admission to the medical school, would be built on considerably in histology and gross anatomy; in obstetrics much would be added and postnatal development would be stressed in pediatrics. Little would be lost, provided always, that close attention is given to instruction in prerequisites.

The second prerequisite is an elementary course in microscopic anatomy, given parallel to one on mammalian anatomy which should be required as an introduction to gross anatomy. This course, offered in a few universities, is not always as effective as it could be. Like embryology, it should be adapted to the needs of medical students. Instructors who go out of the way to illustrate anything from a squid to a canary, because they think than human tissues should be reserved for later study, miss the point. The student must learn how to use a good microscope, just as in chemistry he must learn how to use a delicate balance and various other pieces of apparatus. He must become so familiar with the minute structure of the human body that he is able to recognize the main tissues and organs: epithelium, cartilage, thyroid, pancreas and so on, again in the same way that he must be able to identify by qualitative analysis a few of the principal elements. In addition, he must acquire some information about cell division, differentiation and organ architecture in relation to function. It is not a great deal to ask. For admission committees to accept students who offer instead microscopic training farther afield is unwise. The idea that intensive training and even original investigation in any branch of biology will so equip the student in a general way that specific requirements can be ignored is somewhat misleading. There is, of course, another biological prerequisite, fundamental alike to histology and to all work in the medical school and practise thereafter, namely, a comprehensive course on man's place in nature.

Insistence on embryology and microscopic anatomy as prerequisites would undoubtedly make way for improvements in teaching. The students would gain a better conception of the relation of form and function. The course in histology would have more force as an introduction to physiology, because in the new histology a considerable amount of elementary physiology would be taught. The objection, that this would constitute a trespassing by amateurs (the histologists) in the domain of departments of physiology, would not be raised. Physiologists have viewed with interest and gratification the fact that their chosen field has outgrown departmental barriers, witness: papers presented at meetings of the American Association of Anatomists and Allen's cooperative book on "Sex and Internal Secretions."

7. *That the main prerequisites for all subjects be incorporated in a six year medical course.* The medical faculties would then enjoy full responsibility and it would not be necessary to try to persuade the members of other faculties to offer courses designed for premedical students in whom they are not particularly interested and see no representation in their pay checks. The conservatives may assert that this would be a step backward. No one will deny the achievement of the Rockefeller Foundation, directed by Pearce, and of the General Education Board, under Flexner, in presiding over the transformation of some weak professional medical schools into departments of universities and in thereby raising standards. To have proposed twenty years ago, that histology, anatomy and physiology should be taught to medical students in direct articulation with the clinical sciences and not as independent subjects for their own inherent scientific value, would have been heresy. When I made the suggestion, I was promptly squelched. To go much further and adapt premedical subjects to professional requirements is a radical change; but standards would certainly not be lowered and the medical schools would continue to be important parts of universities. The cry may have some justification that it would none the less have a narrowing, constricting effect on the minds of the students and that the broad background they need would suffer. They might have a little less biblical history, national government and military science; for the subjects that they do study at present are bewildering in their variety. It can be argued that any work carefully done under an inspiring teacher is helpful, but the relation of some of these to medicine, is rather elusive. Early devotion to medicine might, in truth, be inadvisable were it not for the character of the medical training itself (before the clinical specialties appear) which serves to expand any student's horizon. The best medical schools can be regarded as schools of correlated sciences pertaining to man in the broadest sense.

The derangement of present conditions causd by this change might not be so great as one would expect. The modification could not be brought about in the same way in many universities for their internal organization, to begin with, is seldom the same. In some cases the subjects would continue to be taught in the same laboratories and by the same people. The instructors would retain their positions and salaries; but they would be appointed members of the medical faculty also, granted some additional remuneration, and, what is very important, every effort would be made to have them meet established members of the medical faculties by service on committees, by frequent informal conferences and in other ways. The cost need not be great and university departments, often less well endowed than the medical ones, would obtain a little financial relief. In

other instances, it might appear feasible to make additional full time appointments of biologists, chemists, physicists and others in the schools of medicine. Though much more expensive, the medical schools would be greatly improved thereby both in respect to teaching and research.

The training demanded by the schools as qualification for admission to the suggested six year medical course would doubtless be exacting in some instances and less so in others. Two years in a university after high school graduation would mean that the same time would be required to take the medical degree as when a four year university course is made prerequisite to a four year course in medicine. Despite the fact that the caliber of instruction in public and private schools ranges all the way from very good to distinctly inadequate, it would be safe, in special cases, to ask for only one year of experience in the university before beginning the six year course. Some might even advocate passing from high school directly into the six year course for superior students, who are the only ones who should enter medicine anyway. But in any case the students would come to the university medical schools younger than at present, more adaptable and perhaps fresher and less spoiled. The first two years of the six year course could be regarded as the proving ground of their ability which would relieve instructors in the fundamental preclinical sciences of the four year course from bearing the brunt of weeding out undesirable students. The plan would be first put into operation in the more far-sighted schools of medicine. This would mean that they alone would offer the particular and carefully adapted courses called for and that acceptances of students from other institutions in the third year of the six year curriculum would be sharply limited. But the healthy shift of students from one university to another would not long be curtailed if the plan proved successful and were generally adopted.

The content of these additional years would obviously have to be very carefully studied from many angles and in the light of experience in Canadian and English university medical schools. It is safe to predict that the student's time would be utilized more effectively. Other disciplines, besides the subjects referred to, would be involved, for it would be also worth while to adapt courses in English and mathematics, perhaps Latin, and other subjects to medical requirements. Often this would result in abbreviation—a condition much to be desired in view of insistent demands for expansion. The chief advantage of such a six year course would be a decided loosening up of medical training giving opportunity for experimentation. This would be felt all along the line. The two major discontinuities between premedical and preclinical subjects, on the one hand, and between preclinical and clinical, on the other, could be

smoothed out. It might be advantageous to begin the clinical work a little earlier and to arrange for a projection of certain preclinical subjects into the clinical years. It is easy to let one's imagination run away with the possibilities for improvement.

8. *That histologists and gross anatomists take the lead in a systematic character study of students.* In the present four year course theirs is a strategic position. They are the first to meet the entering students most of whom are new in a strange city. Some students have financial, social or family worries, others may be unwell and the majority are somewhat dazed. They are expected to plunge immediately into courses which may seem more difficult and exacting than any they have previously experienced. Their schedule is a heavy one and they have very little time for calm and collected thought. The histologist must be a guide, philosopher and friend who does not stand on ceremony but actively helps the students to overcome a wide variety of handicaps. He must also have the courage, after consultation with others in charge of the first year class, to advise students not fitted for medicine to drop out for their own benefit and that of the public, and he is often called on to talk with fathers and mothers, sisters and brothers. In doing so he gains an impression of how each individual faces and overcomes difficulties of adjustment which will not be encountered subsequently. While teaching, he, like his colleagues in later years, will find evidence of ability to cooperate, of perserverance, originality, leadership, common sense and many other attributes both good and bad.

This knowledge of personality is important and should be set down in writing before the conclusion of the course. It should represent the first step in a study which will be carried on with meticulous care by all other instructors in major subjects until the time of graduation. If the responsible officers of the school will strengthen these studies through use, the plan will be successful. When the time comes to recommend members of the graduating class for internships, or other appointments, their character and aptitude in special directions will be clear, in the opinion of all of the principal instructors, and will supplement the actual grades as well as the regular reports from the student health service. In other words, the recommendations will be based on personality, scientific ability and physical constitution.

Not the least important result of this move, commenced by histologists and anatomists owing to their unique opportunities, continued by the rest and followed up by the alumni organization, will be its effect on the faculty. Reputations will be lost and won. Those who never recognize the qualities of leadership, when they encounter them, will be open to the accusation of mental blindness and possibly of teaching in an uninspiring

way. Conversely, the reward of the gifted few who can discern potential greatness and lend a helping hand will be entirely satisfying.

9. *That an inquiry be made of teaching qualifications and of performance.* How to place a premium on good teaching in the medical school has been debated and should be considered seriously. To substitute therefor research ability is unfair to the students and the public. A man, devoted to research, is often an excellent teacher; but occasionally he is a sad mistake as a teacher. He should not be allowed to hide behind those imposing papers in current journals that are dear to the hearts of university presidents. On the other hand, we often hear that "so and so" is of value to the school because he is popular as teacher though lacking as an investigator. But how do we know that he is really an effective teacher?

To measure teaching ability is obviously extraordinarily difficult. There are two kinds of teaching—formal in the classroom and informal at odd hours and very individual. The first is set forth in the catalogue and listed in hours. Temporary enthusiasm on the part of the students is something; but it must be weighed in the balance with their mature opinion in retrospect years after graduation. This should be considered side by side with the accuracy of the opinion that he forms of them (recorded, as I have ventured to suggest, in writing) and the judgment of his colleagues in the school of medicine regarding the content and conduct of his course. But if we fail to take account of the second kind of teaching also, because it is rather elusive, we shall be doing a grave injustice. In some cases it is both more important and time consuming. It is given in the finest spirit, freely and without thought of recompense. Medical students, graduate students, interns and many other, even practising physicians, are involved.

We must somehow learn to recognize instruction of high caliber, insist on improvements when necessary, and, when convinced against our will, discontinue a useless teacher or give him full time for research. The day is past when the histologist, or any other teacher, will assume the superior attitude, that he knows more about his subject than anyone else in the institution, that by some divine right he must be permitted to do exactly as he likes, and that advice, even though courteously rendered, is an insult. Now, he is introspective, welcomes criticism and takes thought for the morrow—what it shall bring forth.

The Nervous and Mental Factors in Medicine*

CLARENCE O. CHENEY, M. D.
Professor of Psychiatry, Columbia University,
New York, N. Y.

Exact, complete figures are not available to give the true incidence of nervous and mental disorders in the general population which medicine may be called on to treat. Some evidence of their frequency is brought forth, however, when it is shown that of the somewhat more than one million hospital beds in the country, nearly half a million are provided for patients suffering from nervous and mental disorders. Statistics of the Federal Census of mental patients in state hospitals for 1932 show that 167 state hospitals housed more than 318,000 patients and nearly 37,000 were on parole. During that year, more than 93,000 patients were admitted to these same hospitals and 40,000 were discharged, more than 11,000 of these as recovered and another 18,000 as benefited by treatment. More than 27,000 patients died. There were on the hospital staffs 1,400 physicians, 25,000 nurses and attendants, and other personnel totaling more than 50,000. The cost of operation of these hospitals during 1932 was in excess of 112 million dollars.

In New York State alone, on July 1, 1935, in the state hospitals under the Department of Mental Hygiene, there were nearly 60,000 patients and 5,500 on parole. On the books of the institutions for mental defectives there were an additional 14,000 patients. These, with the patients in private institutions, made a total of more than 89,000 patients on the books of mental institutions in this state on July 1, 1935. The expenditures by the Department of Mental Hygiene in the State of New York for the care of nervous and mental patients exceeded 35 million dollars for the year 1934. This, of course, does not take into consideration the cost of private care. As already mentioned, we do not know the actual number of persons suffering from nervous and mental disorders who are not hospitalized but who are treated by private physicians or who receive no treatment.

These figures are cited to give some indication of the tremendous problem that nervous and mental disorders create from the social and economic standpoints. They offer a challenge to medicine not only in their care and treatment but in their early recognition and prevention.

Approximately one-half of the number of patients in hospitals for nervous and mental disorders are found to have gross or microscopic altera-

*Address delivered at the Opening Exercises of the academic year of the College of Physicians and Surgeons of Columbia University, September 25, 1935.

tions or pathology of the central nervous system. In this large group are various sub-groups classified according to the various factors causing the changes in the central nervous system. One of these sub-groups is made up of those elderly persons who show general impairment of their intellectual functions and whose brains show the degenerative changes of old age. Another group is made up of those persons whose cerebral functions are interfered with by circulatory disorders, particularly hardening of the arteries or arteriosclerosis. The pathologic changes of cerebral syphilitic involvement are found in 8 per cent of the patients admitted to hospitals for nervous and mental disorders. Brain tumors and the lesions of head injuries are found in other patients who suffer from mental disorder. Intoxication from alcohol, the poisoning from other external or exogenous factors, such as lead and carbon monoxide, are potent factors in producing changes in the central nervous system. The endogenous or internally-arising intoxications from infections, such as pneumonia, typhoid, influenza and septicemia, which also bring about pathologic changes in the central nervous system, are causative factors leading to nervous and mental breakdown. In any of these conditions we find a breaking down of the integration of the personality so that a variation in the thinking, feeling and acting of persons affected is brought about.

The pathologic changes found in the central nervous system are obvious and demonstrable evidence of a disturbance in the structure of the delicate nervous system and we conclude, therefore, that the changes brought about by syphilis or arteriosclerosis or alcoholism are the main etiologic factors of abnormal reaction of the personality of the individual. But we do not see in the symptoms only and merely the reaction to the pathologic change. We feel that these disorders which may lead to hospitalization are the reaction of the whole organism to a disturbing factor. The particular symptoms or peculiarities shown by the person who suffers changes in his central nervous system depend not only on the type and location of the disease process but on the kind of person the disease process is affecting, and the type of person depends on the initial constitution and habitual tendencies of that person to react, as shown in past performances or past reactions to living. The reactions depend not only on his conscious tendencies but also on his underlying tendencies which previously have been controlled when the whole organism has been able to function in a smooth, well coordinated manner. When the integration is broken down by some disease process, ideas and feelings are not integrated and the person acts queerly, or is changed in a disorganized way.

However, in approximately half of the patients admitted to nervous and mental hospitals one cannot find by the most careful clinical or gross

or microscopic post-mortem examination of the nervous system any specific or definite changes to suggest disease processes. Those patients showing personality changes without demonstrable disease changes in the central nervous system are assigned mainly to the manic depressive, dementia praecox and psychoneurotic groups. On the theory that there is no function without structure, and that abnormal function means abnormal structure, and that the brain is the organ of the mind, many years of study and research have been devoted by many persons to find the pathology or the diseased structure of these mental disorders which are termed functional. It was argued that there must be something wrong with the brain if a person had delusions of wealth or persecution or hallucination of hearing or vision and the locus of the disorder in the brain has been indefatigably sought. Changes in the finer structures, particularly in the nerve cells, in the brains of those persons dying with these so-called functional mental disorders, have been reported by various investigators, but they have not been specific or constant or conclusive, and the fact that these changes might be incidental or post-mortem or artefacts has often not been considered carefully.

However, it may be pointed out that mental abnormality is relative. A Republican may believe that a Democrat has something wrong with his brain, or vice versa, and the one might think that the other had delusions or strange ideas, for which he needed treatment, but we have hardly gotten so far as to expect to find lesions or disordered structure in the brains of either Republicans or Democrats or of those holding certain religious or mystical beliefs, to explain these beliefs, and so we are inclined to regard these mental disorders, which have been termed functional, as being reactions of individual persons with their innate make-up, influenced by their experience and training, their wishes and desires, as being attempts at adjustment to their life experiences. As a simple example, we might point out that some persons blush easily; others do not blush on any provocation. Some persons easily develop diarrhea under emotional strain; others never. Some persons will develop symptoms of hyperthyroidism under emotional stress, whereas others show no indication of thyroid hyperactivity under apparently the same emotional influence. Some persons will show in reaction to depressing influence overt manifestations of weeping and wailing; others will not have any outward manifestation, but the tension may show itself in contraction of the stomach with the reaction of indigestion and vomiting. Many other every day examples of different reactions of the human organism to similar influences in different individuals could be cited to emphasize the different constitutional or physiologic or biologic types of response. In such differing individuals we do not find differences

in structure to explain the differences in response. Visible structures may be the same, but the combination of functions of the various integrating systems is different and one individual reacts more strongly or more definitely than another.

Put in another way, we may say that the different reactions of persons or their parts or systems are the manifestation of varied energy distribution and conversion. Man may be said to be an energy transformer. He receives his energy from the environment not only through his food but through the stimulation of light, heat, sound and pressure, and transforms these different types of energy into metabolic processes, sensori-motor activity and thinking. Man does not create energy in himself. The proper intake and use of energy is healthy living. The inadequate intake or the faulty distribution or release of energy constitutes dysfunction and constitutes the sick man. The nervous system as the transmitter and transmuter and controller of the distribution and use of energy plays an important part, but a smoothly working, whole organism, is essential for health. For stable equilibrium in his environment, for getting the most satisfaction, a man should have an even balance of adequate incoming and outgoing energy. Some persons fundamentally take in little; they react little to the environment and they give little. Their general transformation of energy is slight. They are the indifferent persons who care very little for what goes on around them, are sluggish in their somatic and psychic fields; they acquire little training of their organs to respond and they add little, if anything, to the world's or their own satisfaction. They constitute the type that is essentially inadequate and that we not infrequently see in mental hospitals as cases of dementia praecox of the simple type.

On the other hand, there are persons who are absorbing and giving out energy at a rapid rate to a tremendous degree. They are reacting constantly to everything around them and giving to everyone with whom they come in contact. Their bodily activity is accelerated and they apparently derive much satisfaction in living. Many such persons are well adjusted and stable and constitute good members of society. One finds, however, not infrequently that the energy output of such an energetic person is not well coordinated; that frequently there are changes in direction of physical and motor activity, a jerky lack of coordination similar to that of an automobile which is not firing evenly. One begins, then, to suspect something wrong with the distributional control of the energy. One is apt to find that the whole situation has been due to a fear of not being adequate, a feeling of inferiority, with an eccentric attempt at compensation, an attempt on the part of the individual to show himself and others that he is not as inadequate as he fears he is. Or the energetic individual who shows

the eccentric drive may be running away from himself. Energy is trying to flow out in channels that he fears to open. Frequently the outlet for instinctual desires is dammed up because of social demands and the energy is shunted in another direction. As long as the output is smooth and well coordinated, this diversion of energy may be helpful. We see, then, the diversion or sublimation of energy into constructive, often socially useful channels. Often, energy, instead of flowing smoothly into socially acceptable channels with resulting satisfaction, may become dammed up and diverted into unhealthy or unuseful ways.

Psychic energy, which should happily be used as such, often is not allowed full flow and comes out in other, often unexpected places. Symptoms of nervousness, tension, or overt mental disorder may result. A man who wishes that he could tell his employer just what he thinks of him but because of expediency cannot do so, has energy dammed up in him and the tension needs to be released in some way. He may have an outlet in scolding his wife or berating his children, or he may have relief from this tension by going to a baseball game and yelling at the umpire the emotionally charged names he would like to call his employer. Or he may work off his energy at a prizefight by identifying himself with one of the contestants in the ring, and his employer with the other. The dammed up energy has been released. Often, however, particularly in persons who do not have or use these comparatively normal energy outlets, the force is diverted to the cardiovascular system with palpitation and cardiac distress.

Another man in the same situation may, according to his innate and habitual organic capacity for response, develop a reaction in the gastrointestinal tract, of increased secretion, gastric burning and pain or increased peristalsis or diarrhea. If he is of another nervously reacting type, he may develop constipation under an unrelieved tension. So, various unresolved conflicts and frustrated impulses with their dammed up energy may in some persons bring about a vicarious diversion of energy into gastrointestinal, respiratory, cardiovascular or muscular systems with symptoms which are difficult to distinguish from those associated with the distinct structural pathology in these systems brought about by other causes, such as direct infection or injury. We say in "some persons" as it seems to be in that group of persons who appear to have inherent defects of adjustment, defects of coordination and smooth working of energy releases that these reactions appear. Or, if the lack of coordination is not inherent, it is often acquired in childhood and shows itself frequently in a lack of diversity of interests, a lack of seizing or acquiring many energy sources or outlets. They seem limited and when demands for adjustments are made on them they begin to miss fire.

Individuals who show various and variable physical symptoms and in whom under most careful examination, "no signs of disease can be found in the organs" make up a large share of the hospital and private practice of the physician. They are usually said to be "neurotic" or "psychoneurotic," according to one's choice of terminology. They have been and still are one of the most perplexing problems of medical practice. They have frequently been sent away with the admonition that "there is nothing wrong with you; you imagine you are sick." These persons have been the source of the spread of various religious cults and coteries for in such activities they found something that gave them a release for their energies. If a person uses as much energy in stoutly denying he can have a pain as he used before in saying he had it, he is apt not to have the pain.

Regretably, the term neurotic or psychoneurotic when applied to a person has seemed to have carried with it something of a derogatory implication closely akin to shamming. This has seemed unfortunate because these people are just as sick in the misuse of their energy and in their coordination as are the somatically diseased. It would be a happy event if some other term than neurotic or psychoneurotic could be found and utilized to designate particularly those ordinarily well balanced, stable persons who under unusual stress and strain, with much incoming energy in the way of social and economic problems which must be solved, become tense and keyed-up and develop various somatic symptoms and incoordinations as a result of the unreleased energy. The persons in whom these episodic, temporary reactions occur are fundamentally "stronger," more dynamic persons than are those mentioned above, who tend to be fundamentally inadequate and whose symptoms are apt to be more fixed and lasting. Perhaps, the term psychosomatic reaction would be more acceptable and less objectionable than psychoneurotic. It would certainly be more descriptive. On the other hand, we may eventually all agree that a neurotic or psychoneurotic reaction is a psychosomatic reaction, without implying a stigma on the personality and meaning merely that it is a reaction of the whole organism, a combination reaction of what we have habitually termed mind and body.

Thus far we have spoken essentially of the transformation and direction of what should be used as psychic energy into somatic energy with somatic symptoms, but we may now speak of the diversion of normal psychic energy into the abnormal—abnormal in that it is not used in the way that is best for the individual. Conflicts and frustrated wishes with the damming up of energy may show themselves in fears that seem senseless to the individual and to others, in hallucinations and ideas of persecution. A person who has a strong desire to do something that is not compatible

with his individual training or with his feeling of obligation to society, defends himself against doing it by developing an uncontrollable fear that he will do it or a fear that he will do something else that is symbolic of the original desire. Because of the antipathy to giving way to the desire, he is forcing himself to try to forget it but the energy is still there waiting to be released. It is released by the energy the person spends on the fear. Feelings of love or hate for another person, which an individual may not admit to himself, may be projected on that second person and the first one then develops a feeling against the other and so releases his energy. Thoughts that are not allowed to come to consciousness may be hallucinated, that is, they may seem to the patient to come from someone else and the patient reacts to them as he would like to if he allowed himself to have them. He thus releases his stored up energy but does not have to accept responsibility for ideas which he would consciously deny.

The person who is nervous or fidgety or ill-coordinated has something wrong with his energy utilization and it may be most helpful to the patient to have the physician make every effort to seek out the cause of this damming up and improper release of energy. Often conflicts and difficulties are not in the unconscious but may be on the surface, only waiting for a release when the patient finds someone who seems to understand and is willing to listen to what seem even to the patient strange and unaccountable ideas or fancies. The longer the unreleased energy remains dammed up, or the longer it continues to flow out into undesirable channels, the more apt the habit is to be established and, therefore, the more apt there is to be chronic involvement or chronic illness of a nervous or mental nature. The physician has not only to try to find the cause of various reactions within the individual himself but to seek possible causes in the environment of the patient; that is, in his social and economic situation and in the persons with whom he comes in contact, particularly members of the family. The family situation which has the patient caught, as it were, in a trap, may not be brought to light by the patient himself because of the feeling of loyalty to the family and the desire to keep family matters confidential. The physician may never find the source of the real difficulty, therefore, if he sees and knows only the patient. Not infrequently, the reactions of our nervous and mental patients are reactions to difficult family situations. Therefore, the physician's field of activity lies in the treatment not only of the patient but of the whole family situation. This principle applies paricularly to children who are regarded as being "difficult" and as showing nervous and mental symptoms.

Also, the physician will often find that conditions have been established in a patient which are practically impossible to relieve or alleviate and

that the only treatment that can be devised for the patient himself is palliative. However, in these situations one finds that members of the family are tremendously concerned and show nervous and mental reactions themselves and it then seems to be the function of the physician to treat the patient in a way that will be most helpful in relieving symptoms in the family. For example, where a wife who is nervous has been very much attached to her husband who is mortally ill, it may not be most helpful for the sick husband to have the wife constantly at his bedside, but if it is helpful to the wife, her wishes must be considered, so that a release of her energies will be effected and a damming up into more serious, somatic or psychic symptoms be avoided.

May I leave the thought with you, therefore, that reactions which we term "nervous" and "mental," often are reactions brought about by diseases of the nervous system, causing a breakdown of a previously well integrated personality, but that at least an equal number of these nervous and mental reactions do not arise from disease processes with structural change. Rather are they manifestations of poorly working organisms with inadequate or diverted uses of psychic and somatic energy which might if directed or guided, be used in a coordinated, integrated manner for health. The function of the physician as we see it, therefore, is not only to treat the recognized disease processes found in certain nervous and mental disorders but to act as a guide or coordinator of these incoordinated dysfunctioning persons, to use his skill and efforts in putting them in a smoothly running, more efficient working condition, and to try to build them up into personages who can meet the demands made on them and respond in ways that will give satisfaction in living, in place of disharmony, unhappiness and incapacity.

The carrying out of such a function demands an interest in, and an attempt at an understanding of, persons as they are; a knowledge of the biologic, economic and social forces which seem to drive some persons to the top, but which overweigh others; an unbiased mind open to an increasing understanding of the so-called frailties and trivialities and often the apparently senseless behavior of man. With such an understanding of the deviations, distortions and twists of personality in his patients, the physician may be expected to play a major part in the solution of the problems of nervous and mental disorder, working with others who have to do with the rearing of the youth of the country and the guidance and direction of their energy into healthful channels.

"Whoever is unable to treat the diseases of the mind is no physician." This is not an original statement of mine nor a new idea. It is a quotation from Franciscus Sylvius who expressed this thought in 1620.

On the Practical Value of Instruction of Undergraduate Medical Students in Public Health and Industrial Medicine

ERNEST C. DICKSON
Professor of Public Health and Preventive Medicine
Stanford University School of Medicine, San Francisco, California

In an attempt to ascertain the extent to which the subjects taught in the department of public health and preventive medicine at the Stanford University School of Medicine are of practical importance in the professional activities of the younger physicians, a questionnaire (Fig. 1) was sent to recent graduates. A total of 256 men and women graduated in medicine from Stanford in the years 1927 to 1932, inclusive. These classes were selected (a) because the class of 1927 was the first at Stanford to have instruction in the reorganized department of public health and preventive medicine, which includes instruction in industrial medicine, and (b) because it was believed that the members of the class of 1932 would have completed their intern and resident training in hospitals, and would be established in medical practice. The questionnaire was sent to 250 graduates whose addresses were on file.

One hundred and sixty-four physicians responded, so that the study represents approximately 64 per cent of those who graduated in these years. No attempt was made to segregate those who replied into their respective classes.

Of the 164 physicians, ninety-five (about 58 per cent) are or have been engaged in some form of organized public health work or in industrial medicine (Fig. 2). Fourteen are or have been engaged in full time positions—twelve in public health and two in industrial medicine. The remainder are or have been engaged part time in various departments of organized public health or in industrial medicine. A few have been engaged in more than one public health activity or in public health activities and industrial medicine, so that the ninety-five physicians are or have been engaged in 144 activities of public health and industrial medicine.

Something of the detail of their interests are shown in Figure 3. Fifty-three confined their activities to the field of public health; eighteen combined public health activities and industrial medicine, and twenty-five restricted themselves to the industrial medicine field. No information was obtained as to the extent to which preventive measures are applied in their regular medical practices.

These records, although they represent only about 64 per cent of the

total number of graduates in a six year period, show that a surprising number of younger physicians spend at least a part of their time in organized public health activities or in industrial medicine. They effectively refute the not infrequent criticism that instruction of medical students in public health and preventive medicine, including industrial medicine, is of more academic than practical importance, and that it has little direct bearing on the training of young men and women for the practice of medicine.

FIGURE 1.

Questionnaire sent to 250 recent graduates of Stanford School of Medicine.

ARE YOU OR HAVE YOU BEEN:

1. Health Officer? ..... Place and Dates.....
2. Assistant Health Officer? ..... Place and Dates.....
3. City or County Physician? ..... Place and Dates.....
4. School Physician? ..... Place and Dates.....
5. Otherwise engaged in Health Department work? .....
   Give particulars .....
6. Member of a Board of Health? ..... Place and Dates.....
7. Engaged in Industrial Medicine practice? .....
   Names of Firms.....
   Place and Dates.....
8. Other Public Health or Preventive Medicine activities? .....
   Nature and Location.....

FIGURE 2.

The number of recent graduates who report activities in organized Public Health and Industrial Medicine.

Public Health Activities (no Industrial Medicine)	53
Public Health Activities and Industrial Medicine	18
Industrial Medicine (no Public Health Activities)	24
	95
Have not engaged in organized Public Health Activities or in Industrial Medicine	69
	164

FIGURE 3.

Distribution of activities in organized Public Health and Industrial Medicine in which 95 recent graduates have participated.

	Full Time	Part Time	Total
Health Officer or Assistant Health Officer	3	8	11
Member Board of Health		1	1
City or County Physician		12	12
School Physician	3	27	30
Other Public Health Activities	6	42	48
Industrial Medicine	2	40	42
	14	130	144

To What Extent Should Clinical Instruction be Afforded Students of Medicine in Regular Course*

N. S. Davis

Dean Northwestern University Medical School (Chicago Medical College)
Chicago, Illinois

The subject of Clinical Instruction, as a part of the regular medical training required for the student during his attendance on his college courses, is one of much importance, and should receive more attention than has been hitherto given it. That the student should receive sufficient true clinical training to make him familiar with the means and methods of the examination of patients, the diagnostic symptoms of diseases, and the application of remedies, before being authorized to commence the practice of medicine and surgery, is generally admitted.

Whether such clinical training should take place while the student is actively engaged in prosecuting his medical college studies, or should be assigned to one or two years after he has completed the college curriculum, is a question concerning which much might be said. If the student is required to have a good general education and a fair degree of mental discipline before he commences the study of medicine, four years is certainly as long a period as three-fourths of the students can afford to spend in strictly professional study before they commence practice.

Admitting this to be true, I think both reason and experience show that the first of the four years should be devoted exclusively to the study of anatomy, physiology, chemistry and materia medica with abundant practical work in the anatomical, histological, physiological and chemical laboratories with no clinics. But having thus gained at least an outline knowledge of the human body and its functions in health, and some knowledge of medicines, the student is fairly prepared to profit by one or two hours of direct clinical instruction each day during his second, third and fourth annual college courses. Such clinical instruction, however, should not be given to large classes in college and hospital amphitheatres or crowded wards, as is too generally done; but it should be so graded as to permit of adjustment to the need of each year's class, corresponding with the grading of the several branches of the curriculum.

For example, the first year of clinical instruction, which would correspond with the second year of medical study, should aim to make the student personally familiar with the physiognomy and symptomatology of diseases, and with the use of all instruments and appliances for accuracy of examination and diagnosis, both medical and surgical. The second clinical year should be chiefly occupied in the study of the actual pathological processes taking place in the different forms of disease and their relation to the symptoms, including personal examinations, chemical and microscopic, of the secretions and excretions in the several

*This paper was read by Dr. N. S. Davis, president of the Association of American Medical Colleges, at the third annual meeting of the Association held in Detroit, June 8, 1892. It is so apropos to discussions on this subject held today that it is worth being reprinted.

stages of progress of disease, as well as the tissue changes to be found after death. With these studies, the objects to be accomplished for counteracting the morbid processes, correcting the secretions, and preventing permanent or fatal tissue changes, should be clearly indicated. Having thus become clinically familiar with the symptoms, diagnosis and pathology of diseases and the indications desirable to fulfill in their management, the third clinical year should be devoted directly to the study of methods and means of treatment, preventive, hygienic, thereaputic and surgical.

The advantages to be gained by such grading of clinical studies as I have just indicated must be obvious to both the student and the clinical teacher: 1st. By giving to each year of clinical study, limited and definite objects, the accomplishment of which makes his next year's work easier and more thorough, you not only make the student's practical knowledge more systematic and comprehensive, but you add much to his mental discipline and accuracy of observation. 2nd. Such a system necessarily limits the number of students in any one clinical class, and in the same ratio increases the opportunities and value of individual training, which is the most essential feature of all true clinical study. The dispensaries and hospitals of our larger cities in which the medical schools are chiefly located, contain an abundance of clinical material, that needs only judicious arrangement and faithful attention to secure both the most complete clinical instruction and the most skillful service for the sick. But as the subject is to be before you for further discussion, I will not occupy your time with details at present. The principle or system of grading the clinical instruction of students during their consecutive courses of medical college attendance, will be found no less important and advantageous than in the proper grading of the various branches of medicine contained in the college curriculum.

Teaching of Physiological Chemistry

J. F. McCLENDON
Department of Physiology, University of Minnesota Medical School, Minneapolis

Physiological chemistry is the tool of physiology and in its widest sense includes all theoretical chemistry, but here it is limited to the chemistry taught in the medical school. The method of approach depends on the students' previous training in chemistry, and the University of Minnesota requires two and one-third years of college chemistry (although one year of high school chemistry can be substituted for one-third year of college chemistry), and this includes general chemistry, qualitative and quantitative analysis, and organic chemistry. This latter course merely mentions the carbohydrates and the heterocyclic compounds and does not take up the proteins or the cholane (cholesterol) derivatives. Therefore, the organic chemistry of these groups must be taken up, and, yet, with a few exceptions there is not sufficient time to consider at great length their organic structure and reactions, and furthermore it seems probable that the student remembers only one-eighth of the chemistry he has already learned.

Older textbooks divide the subject according to anatomy, i.e., take up chemistry of muscles, the brain, the skin, the kidneys (the urine), the liver, the gonads and blood. Later textbooks divide the subject according to physiology into chemistry of nutrition, digestion, absorption, secretion, excretion, contraction, excitation (brain, nerve and hormones), reproduction, and growth. But I find that the student who has not covered all of the theoretical chemistry of the substances considered, and who has forgotten most of what he did cover, is bewildered by such treatment. Some student has very vague ideas of the difference between aliphatic and carbocyclic compounds and may remember nothing of heterocyclic groups. He probably never applied his previous training, even in inorganic chemistry. Ask him what element gives the color to the red bricks he is looking at and his mind may be a blank. Then ask him how the pioneers procured soap and he is still more likely to answer nothing. It, therefore, seems necessary to take up only one group of chemical substances at a time during the first half of the course and not to consider amino acids until the second half of the course since they contain aliphatic, carbocyclic and heterocyclic groups.

Since the student has not had physical chemistry this must be taken up from the beginning and, therefore, the course is planned in the following manner: Physical and inorganic chemistry are first considered with em-

phasis laid on the physiological applications. Certain aspects of physical chemistry, such as the phase rule, which cannot now be applied to physiology, are omitted. In inorganic chemistry emphasis is laid on the light rather than on the heavy elements, and certain groups of the periodic table, such as the alkalis and alkaline earths and the halogens are given more space than the other groups. In physical chemistry the gas laws are related to respiration and the quantitative relation of gas pressure to osmotic pressure is emphasized in relation to turgitity of cells and water balance. Calorimetry is treated at length in relation to the thyroid hormone. Hydrogen ion concentration, the law of mass action, and catalysis are considered in relation to the speed of reaction, and particularly enzyme action. The general laws of enzyme action are taught in relation to physical chemistry. The action of enzymes on organic compounds are considered a second time in relation to the substrates and a third time (in case the chemistry of the enzyme is known) in relation to substances (proteins) of similar chemical nature, and a fourth time in a summary of digestion at the end of the course.

Inorganic elements are taken up both from the standpoint of protective and of nutrient functions. The stimulating and depressing ions of protective solutions are considered from the standpoint of the relation of their position in the periodic system to their physiological action. The nutrition requirements of inorganic elements are specially considered, and of these (besides C, H and O of CO^2 and H^2O) calcium and phosphorus are especially considered in relation both to protective solutions and to the bones and the teeth and deficiency diseases. The rôle of calcium in growth is especially emphasized. A critical attitude is encouraged in the student by historical treatment of erroneous ideas. For example, the failure to produce rickets on low calcium diets is attributed to the fact that rickets is due to *growth* of osteoid tissue, and lack of calcium in the diet checks growth more quickly than lack of phosphate. Without calcium there is no growth, and without growth there is no rickets.

Lipides, glucides and protides are considered in the usual manner but in reviewing or beginning organic chemistry physiological applications are specially stressed.

Hormones and vitamins, if their chemistry is known, are considered in their proper positions in the chemical classification but they may be considered a second time in relation to their "substrates" or spheres of action. Thus thyroxine is taken up not only with the amino acids but it is also mentioned in relation to the halogens and its calorigenetic action is considered in the physical chemistry section. Adrenaline is considered along with the other amines in relation to protein metabolism, and al-

though insulin is considered a polypeptide and included in the protein section, its action is taken up in a section on glucides. Vitamin D is considered in relation to the cholane derivatives and also in relation to both calcium and phosphate metabolism and the deficiency diseases: rickets and osteoporosis.

Toward the end of the course, after the chemistry and physiology of all the substances have been considered in a chemical order, they are reviewed in a physiological order, in sections on nutrition (including a chapter on vitamins), digestion, metabolism (with a chapter on hormones) and excretion.

Many years ago the attempt was made to cover the didactic field with laboratory work but this is not now possible in the time allotted, and the laboratory work is planned now from a practical standpoint to meet the urgent needs first. Although all the students have had the prerequisites, they are not all medical students and a significant per cent are medical technology students. But it is believed that the practical needs of both of these groups are the same, and the first necessity in the laboratory is to give the student manual dexterity in the performing of quantitative analyses on blood and urine in the hospital laboratory. This work includes taking of samples of gastric juice, blood, twenty-four hour urine, etc. Each student measures basal metabolic rate on the Benedict-Roth-Collins apparatus. The effect of hormones is optional but each student does work on carbohydrate and protein metabolism. Although there is on the laboratory wall an ancient Chinese quotation, "Try it first on the dog," after a hormone or other active substance has been tried on the dog it is not necessary for each student to repeat it, and dogs are expensive. Since this is the introductory course in physical chemistry, didactic experiments in that field must be included. If there is any time remaining, qualitative experiments, such as qualitative color tests of amino acids and carbohydrates, are included.

The student is given not only a written examination on the whole of the didactic and laboratory work but also a practical examination on manual dexterity in the laboratory. A deferred examination, after he has had other courses, is intended to encourage him to apply his knowledge. Without application, we are told by the School of Education that the student forgets 45 per cent in three months.

PROGRAM

for Forty-seventh Annual Meeting of Association of American Medical Colleges to be held in Atlanta, Georgia, October 26-27, 1936

MONDAY, OCTOBER 26

9:30 A. M.

The Need for Closer Integration of the Agencies Interested in Medical Education and Licensure

DR. J. N. BAKER, Secretary Alabama State Board of Medical Examiners and President of the Federation of State Medical Boards.

Liberal Values in Premedical Education

DR. E. E. REINKE, Professor of Biology, Vanderbilt University.

Liberal Arts Background for Medicine

DR. RALPH J. GILMORE, Professor of Biology, Colorado College.

What Medical Colleges Expect Hospitals to Do to Continue the Education of the Intern

DR. FRANK L. BABBOTT, JR., President Long Island College of Medicine.

The Continued Education of the Medical Student During His Internship

DR. C. W. MUNGER, Superintendent Grasslands Hospital and President-Elect American Hospital Association.

1:00 P. M.—Luncheon.

2:00 P. M.—Visit to Emory University School of Medicine.

7:00 P. M.—Annual dinner at Atlanta Biltmore Hotel.

The president of the Association, Dr. John Wyckoff, will deliver the president's address. Other speakers will be Dr. H. W. Cox, president of Emory University and Mr. Preston S. Arkwright, president of the Georgia Power Company.

TUESDAY, OCTOBER 27

9:30 A. M.

Teaching Objectives and Methods in Emory University School of Medicine

Surgery: DR. DAN C. ELKIN, Professor of Surgery.
Obstetrics: DR. R. A. BARTHOLOMEW, Professor of Clinical Obstetrics.
Medicine: DR. R. H. OPPENHEIMER, Dean and Professor of Medicine.
Pediatrics: DR. M. H. ROBERTS, Associate Professor of Pediatrics.
Psychiatry: DR. W. W. YOUNG, Associate Professor of Psychiatry.

1:00 P. M.—Luncheon.

2:00 P. M.—Program arranged by local Committee on Arrangements. Announcements will be made immediately after the opening of the Monday morning session.

7:00 P. M.—Dinner for delegates from member colleges.

8:00 P. M.—Executive Session.

WEDNESDAY, OCTOBER 28

9:30 A. M.

Symposium: Integration of the Medical Curriculum

The Integration of the Medical Curriculum in the Preclinical Years

DR. GEORGE S. EADIE, Professor of Physiology, Duke University School of Medicine.

Self Help in the Teaching of Pathology

DR. WM. BOYD, Professor of Pathology, University of Manitoba Faculty of Medicine.

The Integration of Clinical Medicine with the Preclinical Sciences

DR. J. H. MEAKINS, Professor of Medicine, Faculty of Medicine, McGill University.

The Value and the Need of Coordination in the Teaching of Surgery

DR. ALTON OCHSNER, Professor of Surgery, Tulane University of Louisiana School of Medicine.

Tendencies in Medical Practice: A Study of the 1930 Graduates

DR. H. G. WEISKOTTEN, Dean and Professor of Pathology, Syracuse University School of Medicine.

JOURNAL
OF THE
Association of American Medical Colleges

Volume 11 SEPTEMBER, 1936 Number 5

Atlanta Meeting Association of American Medical Colleges

The forty-seventh annual meeting of the Association of American Medical Colleges will be held in Atlanta, Georgia, October 26, 27 and 28, 1936. Elsewhere (pages 315 and 316) in this issue is published the program to be presented.

Anyone who is interested in medical education is cordially invited to attend this meeting and to participate in the discussions on the papers read. The program will appeal to many,—members of state boards of licensure, hospital administrators, general educators concerned with the preparation of students for the study of medicine and, especially, to those engaged in the education of men and women for the practice of medicine.

The local arrangements are in charge of Dr. Russell H. Oppenheimer, dean Emory University School of Medicine, Atlanta, and give promise of affording pleasure to every attendant on the meeting, regardless of his avocational interest. Atlanta is a beautiful city. Its cotton mills, one of which will be visited, are among the largest in the world. Its golf courses are known to every golfer. Its educational institutions are among the best. In fact, there is so much of interest to be seen in and near Atlanta that a week's sojourn would be none too long. And, then, there is Stone Mountain, 16 miles from Atlanta, on which is being sculptured the largest and most magnificent war memorial in existence. For many reasons, therefore, the attendance at this meeting should be a large one.

HOTEL: The Atlanta Biltmore Hotel is headquarters. All sessions of the meeting will be held in this hotel. Those who intend to come to Atlanta are urged to make reservations early because at this season of the year the South comes into its own as a wonderful winter resort.

RAILROAD RATES: A one and one-third round trip fare, good for fifteen days, is in force on all railroads virtually all year around. This is the same rate as would be allowed as a convention rate. These tickets do not call for validation and permit of stop-overs at any station on the line. Special rates for the South become effective October 15. They may be less than a fare and one-third and permit of a longer stay in the South than fifteen days. On many railroads, ten day tickets can be purchased at a special rate. CONSULT YOUR LOCAL AGENT FOR DETAILS AND SPECIFIC INFORMATION.

◆ ◆

Frank L. Babbott, Jr.

The Columbia University medal for achievement since graduation was awarded to Dr. Babbott who graduated from the College of Physicians and Surgeons in 1918. Dr. Babbott is president of the Long Island College of Medicine. He is one of six alumni to receive this distinction.

College News

Western Reserve University School of Medicine

It has been decided to drop the formal requirement of foreign language credits as a prerequisite for admission (beginning with the class entering in 1937), and to leave these to the judgment of the undergraduate faculties. This step is taken in the interest of simplification of the demands which the medical schools make on undergraduate training, and in consonance with the fundamental policy of not hampering the programs of the undergraduate colleges in such cultural studies as are not immediately essential to the medical course. It should not be interpreted as minimizing the value of language study in general culture. Professionally, some familiarity with the classical languages facilitates the correct understanding of medical terms, and a reading knowledge of any of the foreign languages in which medical treatises are written widens the horizon of the student and physician. However, experience has shown that they are not essential. Indeed, the formal language courses do not insure such intimate familiarity with these languages as to make them of much real use as tools in the study or practice of medicine; and the extension of journals and abstract journals in English makes their professional use less important than was formerly the case, except for those who devote themselves to research.

◆ ◆

Stanford University School of Medicine

Postgraduate medical courses for practicing physicians will be given in cooperation with the San Francisco Department of Public Health and the San Francisco Hospital from September 14 to 18, inclusive. There will be a registration fee of $25. Courses will be given in (1) obstetrics and gynecology; (2) gastroenterology; (3) pediatrics; (4) cardiology; (5) hypertension and nephritis; (6) neurology and psychiatry; (7) fractures and traumatic surgery; (8) proctology; (9) otorhinolaryngology. Four general meetings will be held at which the following subjects will be presented: (1) x-ray therapy; (2) backache; (3) blood diseases; (4) syphilis, diagnosis and treatment.

Applications for registration should be made to the dean of the Medical School, 2398 Sacramento Street, San Francisco.

◆ ◆

Tufts College Medical School

Dr. John L. Jacobs has been appointed associate professor of pathology and bacteriology.

◆ ◆

University of Iowa College of Medicine

Dr. Ruben Nomland has been appointed professor and head of the department of dermatology and syphilology; Dr. Walter R. Ingram, formerly assistant professor of neurology in Northwestern University Medical School, has been appointed assistant professor of neuro-anatomy. Dr. Placidus J. Leinfelder has been promoted to assistant professor of opthalmology; Dr. Jacob J. Potter, to assistant professor of otolaryngology; Waid W. Tuttle, to associate professor of physiology; Dr. Horace M. Korns, to professor of the theory and practice of medicine.

◆ ◆

University of Michigan School of Medicine

Promotions: Elizabeth C. Crosby, to professor of anatomy; Erwin E. Nelson,

professor of pharmacology; Charles R. Brassfield, M. S., to assistant professor of physiology; Frank Hartsuff Bethell, Stanley M. Goldhamer, and Franklin Davis Johnston, assistant professor of internal medicine; Don Marshall and Luis Yglesias, assistant professor of surgery.

The Edward Swift Dunster Scholarship has been made available. The interest from a fund of $1,500 will be used for the scholarship, which is named in honor of the late Dr. Dunster, who was for many years a professor in the medical school.

◆ ◆

Washington University School of Medicine

Dr. W. McKim Marriott, since 1923 dean, has resigned to become dean and professor of research medicine at the University of California Medical School. Until a new dean has been appointed, the affairs of the medical school will be administered by a committee of three faculty members: Dr. David P. Barr, head of the department of internal medicine; Philip A. Shaffer, Ph.D., head of the department of biologic chemistry, and Dr. Evarts A. Graham, head of the department of surgery. Dr. Marriott will be succeeded as professor of pediatrics and physician-in-chief of the St. Louis Children's Hospital by Dr. Alexis F. Hartmann, associate professor of pediatrics at Washington.

◆ ◆

Vanderbilt University School of Medicine

PROMOTIONS: Dr. George S. Johnson, from assistant professor to associate professor of surgery; Dr. Thomas D. McKinney, from assistant professor to associate professor of clinical surgery; Dr. Alvin E. Keller, from assistant professor to associate professor of preventive medicine and public health; Dr. C. C. McClure, from assistant professor to associate professor of radiology; Dr. Thomas C. Butler, from instructor to assistant professor of pharmacology; Dr. Nathaniel S. Shofner, from instructor to assistant professor of clinical surgery; Dr. James W. Ward, from assistant to instructor in anatomy; Dr. John W. Simpson, from assistant to instructor in obstetrics and gynecology; Dr. Alexander W. Pierce, from assistant to instructor in pediatrics; Dr. Henry M. Carney, from assistant to instructor in surgery.

Dr. Thorwald Madsen, of Copenhagen, Denmark, will deliver the fifth series of Abraham Flexner Lectures during the 1936-1937 session. He is director of the State Serum Institute.

◆ ◆

University of Pennsylvania School of Medicine

Dr. Isidor S. Ravdin, J. William White professor of surgical research and professor of surgical research in the Graduate School of Medicine, has been appointed to the newly established George L. and Emily McMichael Harrison professorship of surgery. The department of research surgery was established under the terms of the will of the late Mr. Harrison, who provided that the income of his residuary estate, approximating $40,000 a year, be used for this purpose.

◆ ◆

Wake Forest College School of Medicine

At the meeting of the Board of Trustees held June 1, enlargement of the library was authorized and Mrs. Margaret R. Cardwell, Jr., was elected librarian. Mrs. Cardwell received the A. B. Degree from Smith College and the A. B. in Library Science from the University of North Carolina. She has had six years' experience in library work.

Herbert C. Tidwell, Ph.D., was elected Grier Research Professor of Biochemistry. This professorship is supported by a grant from Dr. G. Layton Grier of Milford, Delaware. Dr. Tidwell received

the A. B. and M. A. from Baylor University in 1919; Ph.D., Johns Hopkins, 1930; instructor in pediatrics, Johns Hopkins University, 1930-1935; instructor in biochemistry, Duke University, 1935-1936. Robert Page Morehead, B. A., M. A., M. D., was elected instructor in pathology. Dr. Morehead received his M. D. from Jefferson Medical College and is at present connected with the department of pathology of the Philadelphia General Hospital. Dr. E. S. King, professor of bacteriology, was granted a leave of absence. In September he will go to Harvard Medical School where he will serve as a volunteer teacher in bacteriology. Dr. George C. Mackie, professor of physiology, will take postgraduate work in Edinburgh University during the summer. Dr. C. C. Carpenter, professor of pathology since 1926, was elected Dean of the School.

◆ ◆

Jefferson Medical College

The One Hundred and Eleventh Commencement was held June 5, 1936. The valedictory address was delivered by Dr. John H. Finley, associate editor of "The New York Times."

The graduating class numbered 133, bringing the total number of graduates to 16,175. The graduates originated in seventeen different states and insular possessions. Twenty-nine members of the graduating class were commissioned as first lieutenants in the Medical Officers' Training Corps of the United States Army.

Promotions and new Appointments: Baldwin L. Keyes, clinical professor of psychiatry; Hobart H. Reiman, Magee professor of medicine and professor of clinical medicine; Martin E. Rehfuss, professor of clinical medicine; David M. Davis, professor of genito-urinary surgery; John B. Flick, associate professor of surgery; Henry K. Mohler, clinical professor of therapeutics; Lewis C. Scheffey, associate professor of gynecology; Harold L. Stewart and David R. Morgan, assistant professor of pathology; Adolph A. Walkling and Henry K. Seelaus, assistant professor of surgery; William H. Schmidt, assistant professor of physical therapy in the Department of Neurology; Roy W. Mohler, John B. Montgomery, Charles Lintgen, and William J. Thudium, associate in gynecology; Andrew J. Ramsey, associate in histology and embryology.

Sir David Wilkie, professor of surgery, faculty of medicine, University of Edinburgh, will give a series of twenty-five lectures during November and December, 1936.

◆ ◆

George Washington University School of Medicine

The William Cline Borden Memorial Lectureship in Surgery has been established by Mrs. William Cline Borden and Dr. Daniel LeRay Borden, wife and son of the former dean of the medical school. It is planned to give the lectures at the medical school annually. Dr. Borden, who died in 1934, was professor of surgery and dean of George Washington University School of Medicine from 1909 to June, 1931.

◆ ◆

University of Chicago Division of Biological Sciences

A bust of Dr. Anton J. Carlson, professor and chairman of the department of physiology, was unveiled June 1, the gift of friends and students. Dr. Carlson has been connected with the university since 1904. He is well known in the field of physiology.

Dr. Walter W. Hamburger resigned as clinical professor of medicine in Rush Medical College.

Dr. Ernest E. Irons has resigned as dean of Rush Medical College but remains as professor of medicine.

The School of Medicine of the Division of Biological Sciences at the University of Chicago and Rush Medical College

are now combined in one institution to be known as the Rush Medical College of the University of Chicago. Undergraduate medical education will be continued at the west side school. The medical schools are united in one departmental organization under the dean of the biological sciences. On the west side Dr. Emmet B. Bay will be associate dean. It is proposed within the next five years to diminish the number of medical students greatly and to introduce graduate instruction on an increasing scale into the curriculum with the possibility that eventually graduate study will supersede undergraduate study entirely on the west side.

Dr. Walter J. Meek, professor of physiology in the University of Wisconsin Medical School, delivered the third annual lecture under the Arno B. Luckhardt Lectureship. The title of his lecture was "A Present Day Concept of Shock."

◆ ◆

Boston University
School of Medicine

Dr. John A. Foley has been appointed clinical professor of medicine and Dr. William R. Morrison, clinical professor of surgery.

◆ ◆

Creighton University
School of Medicine

Dr. Clarence S. Moran has been promoted to assistant professor of pathology and Dr. William H. Schmitz, associate professor of urology.

◆ ◆

University of Toronto
Faculty of Medicine

Dr. William E. Gallie, professor of surgery, has been appointed dean of the faculty for a period of three years, succeeding Dr. J. G. Fitzgerald who resigned to do some special work.

Faculty gold medal, O. M. Solandt; faculty silver medal, C. H. Jaimet and A. M. Large; Ellen Mickle Fellowship, Chappell Prize in Clinical Medicine, William John Hendry Memorial Scholarship in obstetrics and gynecology, Ontario Medical Association Prize in preventive medicine, David Dunlap Memorial Scholarship and Canadian Medical Institute Prize, O. M. Solandt.

Undergraduate: John Copp Bursary, C. C. Gray; David Dunlap Memorial Scholarships, (a) fifth year, W. R. Feasby; (b) third year, J. C. McCulloch. Ronald S. Saddington Medal in pathology, E. B. Tovee; Baptie Scholarship, J. H. Tritt.

Graduate: Reeve Prize, M. H. Roepke and S. L. Cohen. George Brown Memorial Scholarship in medical sciences, R. E. Haist; Alexander McPhedran Research Fellowship in clinical medicine, R. C. Dickson; Perry Goldsmith Prize in otolaryngology, J. A. Sullivan. J. J. Mackenzie Fellowship in pathology and bacteriology, R. P. Douglas; Lister Prize in surgery, H. R. Ziegler.

The Charles Mickle Fellowship was awarded this year to Donald D. Van Slyke, Ph.D., Hon.Sc.D., of the Rockefeller Institute, for his methods for blood analyses and gasometric microanalyses, his work on respiratory and renal functions, on diabetes and nephritis and, in general, for his research on quantitative clinical chemistry. This Fellowship is awarded annually to that member of the medical profession who is considered by the Council of the Faculty of Medicine of the University of Toronto to have done most during the preceding ten years to advance sound knowledge of a practical kind in medical art or science.

◆ ◆

University of California
Medical School

Dr. W. McKim Marriott, professor of pediatrics and dean of Washington University School of Medicine, has been appointed professor of research medicine and dean, succeeding Dr. Langley Porter who has reached the retirement age.

Promotions: L. C. Abbott, professor of orthopedic surgery; T. L. Althausen, associate professor of medicine; Evelyn A. Haymaker, assistant professor of medicine; H. F. Blum, associate professor of physiology; A. C. Bost, H. H. Ray and W. A. Riley, assistant clinical professor of pediatrics; F. C. Bost, W. A. Key and T. G. Linde, assistant clinical professor of orthopedic surgery; H. A. Brown, assistant clinical professor of surgery; F. S. Bruckman and E. J. Munter, assistant clinical professor of surgery; J. L. Carr, assistant professor of pathology; J. W. Crawford, assistant clinical professor of ophthalmology; W. C. Deamer, assistant professor of pediatrics; F. C. Cordes, clinical professor of ophthalmology; F. H. Kruse, clinical professor of medicine; S. P. Lucia, assistant professor of medicine; W. R. Lyons, assistant professor of anatomy; D. G. Morton, assistant professor of obstetrics and gynecology; J. F. Rinehart, associate professor of pathology; W. B. Smith, clinical professor of otorhinolaryngology.

◆ ◆

University of Rochester School of Medicine

The Rockefeller Foundation has made a grant of $10,000 for the investigation of filtrable viruses under the direction of Dr. George P. Berry, professor of bacteriology and associate professor of medicine, and one of $6,400 for the study of the biologic effects of heat by Dr. Stafford L. Warren, associate professor of medicine and radiology.

◆ ◆

Temple University School of Medicine

The degree of Doctor of Medicine was conferred upon 124 members of the senior class June 11, 1936. This is the largest class to be graduated in the history of the School of Medicine.

Promotions: Harriet L. Hartley, M.D., from associate professor in hygiene to professor of hygiene, sanitation and public health.

Appointments: John Franklin Huber, M.D., Ph.D., associate professor of anatomy; Thomas M. Durant, M.D., associate professor of medicine; George Elbert Farrar, Jr., M.D., assistant professor of medicine; David Soloway, M.D., assistant professor of histology and embryology; Lyle Jenne, Ch.E., Walter S. Cornell, M.D., D.P.H., and T. Ruth Weaver, M.D., assistant professor of hygiene, sanitation and public health.

◆ ◆

Duke University School of Medicine

At the graduating exercises held June 8 thirty-nine medical students received the degree of Doctor of Medicine and twelve the degree of Bachelor of Science in Medicine. The following seniors were elected to membership in Alpha Omega Alpha: Vince Moseley and Burton M. Shinners.

The summer quarter commenced June 22, with forty-six students registered here and two studying in England and Ireland for credit here.

Dr. Wiley D. Forbus, professor of pathology, has recently been elected to serve on the National Board of Medical Examiners, succeeding Dr. Howard K. Karsner.

◆ ◆

Wayne University College of Medicine

A number of teaching fellowships are to be established in 1936-1937 in the preclinical basic medical sciences. These fellowships will require full time work at the medical school, about one-half time being devoted to instructing students in laboratory sciences and one-half time to research and graduate study. Such fellows will be registered as graduate students in the university and will be working for Master's Degrees.

Each fellow will elect a major subject for teaching and graduate study, such as anatomy, pathology, bacteriology, physiology, pharmacology, or chemistry, in which department he would carry on his teaching and research. He will also elect a minor subject in one of the fundamental sciences where some graduate study would be carried out but no teaching.

These fellowships are open to students on a competitive basis who have satisfactorily completed the sophomore year of medicine and have a bachelor's degree, and to graduates who have the degree of Bachelor of Medicine and Doctor of Medicine.

Each fellowship will pay a salary of $100.00 a month for ten months and is renewable on the recommendation of the head of the department for three years.

For further information, and to make application, address the Dean, Wayne University College of Medicine, Detroit, Michigan.

◆ ◆

University of Maryland School of Medicine

Beginning with the session 1937-1938, the minimum requirements for admission will be three years of prescribed medical work.

◆ ◆

Harvard Medical School

Dr. William B. Castle, associate professor of medicine, was awarded the honorary degree of doctor of medicine by Utrecht University, June 24. Dr. William E. Castle, since 1908 professor of genetics, will retire in September with the title of professor emeritus. He has been associated with the university since 1903. Dr. Robert T. Monroe, associate in medicine, has been appointed physician at the Peter Bent Brigham Hospital, effective September 1. He will succeed Dr. Reginald Fitz.

◆ ◆

Woman's Medical College

Dr. Martha Tracy, dean, after a year's leave of absence resumed her duties July 1. Dr. Rose Hirschler has been appointed professor of dermatology; Dr. M. Agnes Gowdey, assistant instructor in clinical obstetrics, and Dr. Helen B. Thompson, assistant in clinical surgery.

◆ ◆

University of Minnesota

Dr. Maurice B. Visscher, professor of physiology, University of Illinois, College of Medicine, has been appointed professor and head of the department of physiology.

Dr. C. D. Creevy has been appointed assistant dean.

◆ ◆

Indiana University School of Medicine

Dr. William N. Wishard, professor and chairman of the department of genito-urinary surgery since 1887, has retired.

◆ ◆

University of Illinois College of Medicine

Dr. Warren H. Cole, assistant professor of clinical surgery, Washington University, St. Louis, has been appointed professor and head of the department of surgery at Illinois, succeeding the late Dr. Carl Hedblom.

General News

Some Educational Policies

Dr. William T. Sanger, in his report to the trustees of the Medical College of Virginia, said: "The controlling boards of educational institutions are naturally so much interested in finances and physical facilities that college presidents are likely to be converted into business men rather than continuing as educators, yet presidents must speak out on occasion, not with finality, but as a basis for discussing educational policies.

"In this spirit these suggestions are set forth: That the preparation for medicine be shortened by one year and the medical course lengthened by this year; that the first year of the longer medical course be designed as a transitional year to bridge the hiatus between premedical and medical courses; that 'fear' be taken out of professional education through fundamental changes in the technique of teaching and grading and a change in student-teacher relationships; that students be graded as 'superior,' 'satisfactory' and 'unsatisfactory' rather than by a system of numerical or literal grades or by merely passed and failed, for reasonable recognition should be given to superior students; that the responsibility for initiative in learning be placed more heavily upon the student by making instruction a series of problems to be solved through laboratory, library, and clinics, this being an old but difficult art to put into practice; that in each curriculum some provision be made for discussing the various types of employment to be found in the several fields of the profession chosen because students without adequate information are more likely to stumble into a special field after graduation than to go into it through deliberate plan, predetermined; that a committee of medical and dental school teachers consider together the advisability and the method of correlating clinical medical and dental teaching through the facilities of the new outpatient department; that each faculty of the institution give some consideration to a serious study, through an invited teacher from the outside, of the best of the old and some of the newer techniques of teaching; that continued efforts be made to be of greater service to the alumni and for alumni to be of greater service to the institution; that the professor of medicine and the professor of surgery be employed for whole-time service, compensation increased, and not be allowed to have private patients, giving their full time to teaching, to research, to the education of the house staff, and the junior members of the faculty, in their respective fields; that after certain years of connection with the institution an honorarium be provided for part-time clinical teachers, in proportion to the value of the work performed, beginning with department heads; that some assurance be given to staff members who secure the major part of their living from work in the institution that some provision will be made for them at the time of full, or partial, retirement; that a fellowship system be established involving five or more annual appointments with stipends ample to provide a living outside of the institution for superior graduates who are especially interested in teaching, research, or administration, and who have had the proper internships, or equivalent experience, to justify such appointments."

◆ ◆

Friedsam Foundation Child Neurology Research

A special commitee is to be formed under the direction of Dr. Bernard Sachs, New York, to stimulate research in child

neurology and allied fields, so that physicians and other scientists may contribute to the thorough investigation of problems bearing on the care and cure of those afflicted with any of the nervous and mental disorders from birth through adolescence. This work is to be nationwide in scope and is to be encouraged by stipends, scholarships or otherwise and is not to be limited to special groups or institutions. The committee is to be made up of two neurologists in addition to Dr. Sachs, the director, two pediatricians, one orthopedic surgeon and two laymen.

Details of the program already under consideration will be announced early in the autumn. After September 10, communications may be addressed to: Child Neurology Research, Bernard Sachs, M.D., Director, 116 West Fifty-ninth Street, New York.

◆ ◆

Memorial Hospital New York City

The Memorial Hospital for the Treatment of Cancer and Allied Diseases has received $3,000,000 from the General Education Board for a new twelve story building to be erected adjacent to the Rockefeller Institute. This is a teaching hospital of Cornell University Medical College.

◆ ◆

Examination Without Attendance

Hiram College is encouraging individual study and wiser use of leisure time by permitting students who meet certain qualifications to obtain credit by examination, without a period of class attendance, for certain courses. This privilege is extended only to regularly enrolled students who are of Alpha ranking (an average of at least 2.5 for two consecutive semesters); other students not registered for a full schedule; and those who wish to establish college credit for postgraduate high school work when not needed for college entrance. Any course in the catalogue may be credited in this way if it lends itself to private study and if the instructor is willing for credit to be so established. Other work in the same department must have been taken before credit by examination is validated for final credit toward a degree. Work must be completed and the examination taken within one year.—*Bull. Assn. Amer. Coll.*, May, 1936.

◆ ◆

The Honor Roll

The Dean's List or Honor Roll announced at both Yale and Princeton in March indicates increasing interest in scholarly performance. More than 21 per cent of all students in the undergraduate schools at Yale are on the Dean's List, a list made up of students who have attained a general average of 80 per cent or more in their studies. These students are not limited to the regular allowance of "cuts" but are allowed to regulate their own attendance; the statistics show, however, that 80 per cent of them take less than the number of cuts ordinarily allowed, and of the remaining 20 per cent a negligible number fail to attend classes regularly—*Bull. Assn. Amer. Coll.*, May, 1936.

◆ ◆

The Aim of the Professions

The most significant movement now in educational progress is in the direction of individualization of instruction. Whatever else this means, it means that we must have more as well as better teachers. On the definitely professional side, what is required for the most effective service? It is taken for granted that the professional man has certain general and professional knowledge and is adept in specialized technics and skills. Every one of the learned professions has also a vast and growing literature, with which the practitioner must have some degree of familiarity. No pursuit of man is worthy of being called a profes-

sion which is not constantly adjusting, revising and enlarging the boundaries of knowledge. There is a cogency and an immediacy in the demand for a broad type of professional training. The life of the professions, the maintenance of high citizenship, the refinements of the standards of living, the public welfare, our personal lives are all bound up together in the same bundle. It is in recognition of all this that the leading professions are bestirring themselves in advancing their educational standards. Men are thus produced who are greater ornaments of their profession, but, more to the point, who render a larger and more valuable service to the people, and who in turn as citizens can contribute more effectively to the common weal. Whatever our profession may be, we are pursuing the same human objectives, striving to contribute to the enrichment of the same life and in the midst of it all, as a matter of course, assuming responsibility for the economic competency of ourselves, our families, and others dependent upon us.—*Bull. Assn. Amer. Coll.*, May, 1936.

◆ ◆

William H. Wilder Foundation

A memorial to the late Dr. William H. Wilder has been established by the Chicago Ophthalmological Society. Its purpose will be to establish and maintain a lectureship in ophthalmology or an allied topic. The lecture will be given every year and the interest from a fund of $10,000, now being raised, will be used for the payment of an honorarium to the lecturer and to defray expenses of publication of the lecture.

◆ ◆

American Board of Internal Medicine (Inc.)

The American Board of Internal Medicine, incorporated Feb. 28, 1936, completed its organization June 15. The officers chosen were Walter L. Bierring, M.D., Des Moines, chairman; Jonathan C. Meakins, M.D., Montreal, vice chairman, and O. H. Perry Pepper, M.D., Philadelphia, secretary-treasurer. These officers with the following six members constitute the present membership of the board: David P. Barr, M.D., St. Louis; Reginald Fitz, M.D., Boston; Ernest E. Irons, M.D., Chicago; William S. Middleton, M.D., Madison, Wis.; John H. Musser, M.D., New Orleans, and G. Gill Richards, M.D., Salt Lake City.

◆ ◆

Mary Putnam Jacobi Fellowship

This fellowship of $1,000 for graduate work abroad has been awarded to Dr. Angeline F. Simecek. Dr. Simecek graduated from the University of Nebraska College of Medicine, Omaha, in 1933 and for the past three years has been on the staff of the New York Infirmary for Women and Children. The fellowship is offered by the Women's Medical Association of New York City.

◆ ◆

Extension Post-Graduate Lectures in Pediatrics in Mississippi

Three years ago at the meeting of the Mississippi State Medical Association, held in Natchez, the House of Delegates passed a resolution establishing a permanent Post-Graduate Extension program for its members. The concensus of opinion among the members as well as those conceiving this course, was that obstetrics and pediatrics should be the subjects of the first lectures. Two reasons were given for this decision: first, the greater part of the practice of the average physician is in the field of women and children; and secondly, if medical service in these two groups was improved, a reduction in maternal and infant mortality could reasonably be expected.

On January 1, 1934, a state wide course in obstetrics was inaugurated. This course has been carried on continuously

since, and at the end of this year will close after completely covering the state.

Following the lectures in obstetrics, questionnaires were sent to the physicians of Mississippi. Among other things, they were asked to name their preference for future courses. Approximately 90 per cent asked for pediatrics. As a result, a course in pediatrics was inaugurated on July 6, consisting of five lectures covering the newborn, nutritional requirements in infancy, nutritional diseases of infancy and childhood, the immunizations, and several other important and frequently encountered conditions of infancy and early childhood. The lectures began on Monday evenings or afternoons, as elected by the local physicians, and extended through Friday. They have been given in Clarksdale, Natchez, Laurel, Biloxi, and will be conducted in Yazoo City, New Albany and Booneville. So far they have been well received and the attendance from the adjacent counties around the centers selected has indicated great interest in the idea of bringing post graduate "refresher" courses to the physician. These lectures are being given by Dr. Robert A. Strong, professor of pediatrics in the School of Medicine of Tulane University, New Orleans.

◆ ◆

Cancer Institute

The University of Wisconsin Medical School will conduct a Cancer Institute, September 7-9 at Madison, Wisconsin. The Wisconsin Alumni Research Foundation has made available the funds needed to finance this institute.

Every phase of the cancer problem will be discussed, initial presentations being made by authorities in this field, such as Dr. Lew Kreyberg of the University of Oslo, Norway; Dr. C. C. Little, of the Roscoe B. Jackson Laboratory for Cancer; Dr. Madge Thurlow Macklin, University of Western Ontario; Dr. Edgar Allen, Yale University Medical School; Dr. H. B. Andervorst, U. S. Public Health Service; Dr. Emil Novak, Baltimore; Dr. Henry Coutard, Radium Institute of Paris; Dr. J. B. Murphy, Rockefeller Institute; Dr. Jas. Ewing, New York; Dr. Warren H. Lewis, Carnegie Institute, and many others.

Two Round Table discussions will be held. Among the subjects to be discussed are diagnostic problems, genetics, filtrable viruses, surgery, irradiation, cytology and etiology of cancer.

Anyone interested in cancer research is cordially invited to attend the Institute. There is no fee.

◆ ◆

Wisconsin Alumni Research Foundation

The Foundation has received two patents on the isolation and purification of the gonadotropic hormones of the anterior pituitary gland. These patents were on the application of Frederick L. Hisaw, Ph.D., and Harry L. Fevold, Ph.D., Madison, and were assigned by them to the Foundation. The Foundation announces that although it contributed in part to the development of this research through grants in aid, it will administer these patents in a way designed to benefit the public without thought of any financial return other than that required to safeguard and control proper use of the products. Dr. Hisaw and Dr. Fevold will not receive any pecuniary reward for their discoveries.

◆ ◆

Fiske Fund Prize Essay

The trustees of the Fiske Fund, administered by the Rhode Island Medical Society, have announced that the subject for the 1937 essay will be "Newer Methods of Prevention and Treatment of Acute Anterior Poliomyelitis." The prize is $250. Competitors should forward copies of their dissertations, marked with a motto, to the secretary on or before May 1, 1937. They must be type-

written, should not exceed 10,000 words and should be accompanied by a sealed envelope bearing the motto on the outside and the name and address of the sender within. The author of the successful dissertation must transfer to the trustees his right, title and interest in it for the use of the Fiske Fund. Letters accompanying the unsuccessful dissertations will be destroyed unopened and the papers may be obtained by their authors if requested within three months. The secretary is Dr. Wilfred Pickles, 184 Waterman Street, Providence.

◆ ◆

Nebraska State Council on Medical Education

The Nebraska State Medical Association has formed a council on medical education to direct its eductaional activities. The council consists of a general chairman, the deans of the two medical schools in the state, the chairman of each educational activity, the president, the president-elect and the executive secretary of the state association. Dr. William P. Wherry, Omaha, is general chairman, and Dr. J. Stanley Welch, Lincoln, vice-chairman. Other members are Drs. Charles W. M. Poynter, dean and professor of anatomy, University of Nebraska College of Medicine, Omaha; Bryan M. Riley, dean, Creighton University of Medicine, Omaha; Joseph D. McCarthy, Omaha, speakers' bureau; Earl C. Sage, Omaha, maternal welfare; Ernest W. Hancock, Lincoln, tuberculosis; James F. Kelly, Omaha, cancer; Claude T. Uren, Omaha, hard of hearing, and James E. M. Thompson, Lincoln, fractures; George W. Covey, Lincoln, president; Roy W. Fouts, Omaha, president-elect, and Mr. M. C. Smith, Curtis, executive secretary.

A faculty from members of the association will be organized to prepare addresses to be used in graduate courses, talks for presentation to lay audiences and discussions to be used in county and district medical society meetings. The council will act as editorial critic and adviser to members in preparation of these addresses if desired. It was also agreed that whenever possible the results of special investigations become part of the educational program and that the activities of the council be united whenever possible with those of national and governmental units such as the state board of health, the American Society for the Control of Cancer and the National Tuberculosis Association.

◆ ◆

Western School of Public Health

The University of California and Stanford University have organized a Western School of Public Health to assist health departments of western states in the training of public health personnel. Social security funds are used to finance the school and the education of certain public health workers. Health officers, public health nurses, sanitary inspectors, public health statistical technicians and public health laboratory technicians in the ten western states are eligible on recommendation of their health officers for attendance at these courses, which will be given during the summer months. The object is to train those who are already employed in health departments, provided they are considered worthy of receiving additional education. Applicants for the regular work, which may lead to a degree in public health, will be asked to meet definite matriculation requirements and must be within certain specified age limits.

◆ ◆

George Neil Stewart Memorial Fund

A fund has been established at the University of Chicago in memory of the late Dr. George Neil Stewart, from 1905 to 1907 professor of physiology at the

university, and subsequently until his death in 1930 professor of experimental medicine and director of the H. K. Cushing Laboratory of Experimental Medicine at Western Reserve University School of Medicine, Cleveland. The fund is to be devoted to the research of Dr. Julius M. Rogoff, who has been appointed visiting professor of physiology. Dr. Rogoff, who collaborated with Dr. Stewart at Western Reserve for fifteen years, was until 1934 associate professor of experimental medicine. Since that time he has continued his investigations at the University of Chicago on the physiology of the adrenal glands, with particular reference to their relations to diabetes and hypertension. The fund was established through the contributions of the Louis D. Beaumont Trust, N. L. Dauby, Richard H. Kohn, Frances W. Lang and Howard E. Wise, Cleveland.

◆ ◆

Craig Yeiser Memorial Fund

The University of Cincinnati has received a gift that in five years will amount to $55,000 from Mrs. Louise Fleischman Yeiser to establish this fund in the College of Medicine. She will give $10,000 a year for five years and an additional $5,000 for equipment to carry on research in preventive medicine in memory of her son, who died in 1935 of pneumonia.

An Experiment in Pedagogy

A really worthwhile experiment in teaching was the one carried out last July (1936) in the field of tropical diseases under the direction of Professor T. J. LeBlanc, professor of preventive medicine, University of Cincinnati College of Medicine, and with the cooperation of the School of Tropical Medicine in San Juan, Puerto Rico. Believing that the opportunities now offered to acquire knowledge of tropical diseases is not adequate and that the need for more knowledge is urgent because of the spread of so-called tropical diseases to all climatic zones, Dr. LeBlanc conceived the idea of giving to a small, carefully selected group of students the opportunity to study these diseases at first hand and in their natural habitat, instead of depending entirely on textbook description, elaboration by the teacher, slides, charts and photographs.

The experiment was an outstanding success in every way. While in a way it resembles the field trips made by departments of preventive medicine, in point of time devoted to it, the circumstances connected with it, the number of students, the intensiveness of the teaching and the results obtained, this course was different; more practical; more effective. It was a real clerkship in tropical diseases. It is a new departure in teaching; one deserving of emulation.

Abstracts of Current Literature

The Idea of a Clinical-Pathological Museum

Every museum must express, no matter in how halting a form, some dominant idea. It is the concrete embodiment of the concept in the mind of its creator. A pathological museum is commonly regarded as a receptacle for gross diseased specimens, and the great museums of the world, those priceless storehouses of rare and instructive material, are organized on this basis. But the concept of pathology may be of wider scope than this. It has a functional as well as an organic side. It is concerned with the production of clinical pictures as well as the production of lesions.

Whilst no exception can be taken to the idea of a museum devoted entirely to gross specimens, one may also be permitted the idea of a museum wider in scope, the object of which is to display in addition the microscopic, the clinical, and the radiological aspects of disease. It is this idea which has inspired the work which during the last eighteen months has transformed the museum of the Medical School of the University of Manitoba in Winnipeg, from a strictly pathological into what may be called a clinical-pathological museum.

The means by which such an end may be attained will vary greatly with the individual worker. In Winnipeg, the most important single feature has been the introduction of pictures interspersed with the specimens. These pictures represent gross and microscopic sections, almost invariably in color, animal parasites, blood films, skin diseases, eruptive fevers, diseases of the throat and eye, temperature charts, roentgenograms, electrocardiographic tracings, a great variety of clinical states, and the masters of medicine, both past and present.

In illustration of the general idea we may take a few examples. In the section on Addison's disease in addition to the lesions of the adrenal there is a water-color painting of a patient showing the characteristic bronzing of the skin, a colored illustration of the pigmentation of the mouth and tongue, and a picture of Thomas Addison with a short biographical sketch. Graves' disease is illustrated by a picture of a patient with characteristic exophthalmos and enlarged neck, the gross specimens of the thyroid, the microscopic picture, and a representation of Robert Graves with the usual biographical notes. The first specimen in the section on Bright's disease is a picture of Richard Bright with a brief account of that remarkable man. Not only the old masters are represented, for Harvey Cushing's picture appears amongst the brain tumors, Aldred Scott Warthin's in the section on syphilis, Maude Abbott's in that of congenital heart disease, and so on.

The source of the pictures has been varied. The richest supply of gross pathological illustrations has been the magnificent atlas of morbid anatomy brought out more than thirty years ago by Kast, Fraenkel, and Rumpel, with full pathological descriptions and summaries of the clinical histories in German, English, Italian and Russian. Another excellent collection of pictures of gross specimens is the Atlas published by the *British Journal of Surgery*. For microscopic illustrations in color extensive use has been made of Christeller's beautiful atlas of sections of whole organs and of Woodhead's book on Practical Pathology which contains 275 illustrations of microscopic preparations in color. Old editions of many other textbooks, especially that of MacCallum, have been used

to a like purpose. A valuable source has been reprints of articles from current literature.

A vast storehouse of clinical pictures is to be found in the old editions of textbooks on medicine, surgery, neurology (Purves Stewart's Lectures on The Diagnosis of Nervous Diseases, in particular), ophthalmology, skin diseases, etc. Some of the finest of these illustrations will be found in Byrom Bramwell's Atlas of Clinical Medicine, to which Osler used frequently to refer. Textbooks on ophthalmology are particularly rich in colored plates, not only of the various pictures revealed by the ophthalmoscope, but also of the external lesions of the eye. Most of these plates are used in the section on diseases of the eye, but some are placed in other sections. Thus albuminuric retinitis is to be found in the section of nephritis, choked disc in that of brain tumors, the distended retinal vessels of polycythæmia vera in that of blood diseases, and so on.

X-ray pictures have proved to be a valuable adjunct in teaching the student to view disease as a whole, large *negative* prints being used in each instance. Alongside the specimens of cancer and ulcer of the stomach he sees the characteristic filling defect or crater revealed by the x-rays. The specimens of bronchiectasis become more living when placed beside a characteristic lipiodol picture of that condition. Hydronephoris, gall stones, stricture of the œsophagus, and the distortion of the ventricles in cerebral tumor, are amongst the many lesions which lend themselves to radiographic illustration.

Temperature charts are used where the fever presents a more or less characteristic picture, as in pneumonia, typhoid, malaria, and in the section of the eruptive fevers.

A novelty which has proved of value in teaching is what we have termed the "composite picture." In this various aspects of the clinical and pathological features are combined in one frame. As many as 7 or 8 small pictures may be included behind a glass measuring 10 by 12 inches. Thus in the case of pernicious anemia we have pictures of a characteristic blood film, of reticulocytosis,of normoblasts and megaloblasts, of the gross appearance of the hyperplastic marrow and of its microscopic appearances of phagocytosis of red cells in the marrow, of hemosiderin deposit, in the liver, of another macrocytic anemia (sprue), and of the spinal cord degeneration. In tabes we have the degeneration of the posterior columns (Weigert-Pal stain), the tabetic gait, the muscular hypotonia, the zones of anæsthesia, the occasional ataxia of the upper limbs as shown by the tremulous handwriting, the optic atrophy, and the Charcot joint. In the composite picture of typhoid fever one sees the intestinal ulcers, the early and late microscopic changes in the Peyer's patches, the characteristic macrophages, and the bacilli in the mucosa.

As to the method of display. Here again there has been a general principle, namely, to make the museum an attractive place where the student may spend one or more hours without feeling fatigued. For this purpose it is necessary that the student be seated. Moreover, the natural and restful position in which to study a specimen or picture is the position in which a book is held to be read. With this in view the standard type of museum show case has been replaced by a stand constructed in the form of a reading desk. Each stand is 10 feet long, 4 feet wide, and 5 feet high, but of the 5 feet, 3 feet are occupied by the legs. The stand faces both ways, holds 84 specimens (42 on each side), and is painted white. It contains three sloping shelves, the center one being on a level with the eye of a man sitting on one of the numerous stools with which the room is provided. These sloping shelves are

not adapted for museum jars, but are admirably suited for watch glasses and pictures. The vast majority of the specimens have therefore been transferred into watch glasses. It is remarkable how large a specimen the largest size of watch glass will accommodate. Both cerebral hemispheres can easily be displayed in this way. Certain specimens will obviously not lend themselves to this treatment, notably those with any great degree of depth, but we have designed a stand on similar lines to the above for the comparatively small number of specimens which require large deep jars. The only difference is that the shelves are horizontal instead of sloping.

One of the great advantages of this type of museum show case or stand is that it lends itself admirably to the display of pictures, temperature charts, x-ray prints, etc. These are covered by old x-ray plates from which the film is readily removed, and bound with passe-par-tout. They are distributed among the watch glasses in the section to which they belong.—WILLLIAM BOYD: *J. Technical Methods*, 14:10-18, 1935.

◆ ◆

Annual Report of Rockefeller Foundation

During 1935 the Rockefeller Foundation expended $12,725,439, of which $2,733,050 was for medical science and $2,200,000 for public health work. The major portion of the appropriation for the medical sciences was contributed to projects for the advancement of psychiatry. These included grants to the Institute for Psychoanalysis, Chicago; Johns Hopkins University School of Medicine, Baltimore; Institute of the Pennsylvania Hospital, Philadelphia; Harvard Medical School and Massachusetts General Hospital; University of Michigan Medical School, Ann Arbor; University of Colorado School of Medicine, Denver, and the University of Chicago School of Medicine. Fourteen research undertakings in clinical psychiatry and related fields were aided in the United States, England, Holland and Switzerland. Grants were also made to the National Committee for Mental Hygiene, New York; the North Carolina Commission for Study of the Care of the Insane and Mental Defectives, and the Massachusetts Department of Mental Diseases. Seventy-two fellowships in the medical sciences were administered during the year. The International Health Division sponsored studies on yellow fever, malaria, hookworm, tuberculosis, yaws, the common cold, diphtheria, influenza, typhoid, mental hygiene and smallpox vaccine in various parts of the United States and in numerous foreign countries. In addition, government health services were aided in many states and countries and advanced training in public health and public health nursing was made available to 188 persons. In the field of the natural sciences the foundation expended $2,426,125, with most of the appropriations in experimental biology. These projects included research in universities in many parts of the United States, Canada and Europe on electroencephalography, biologic effects of heat, neurophysiology, cellular physiology, physiology of reproduction, the hormones and vitamins. Fifty-one fellowships in this field were administered during the year.

Book News

The True Physician: The Modern "Doctor of the Old School"

By Wingate M. Johnson, M.D. The Macmillan Company, New York. 1936. Price, $1.75.

This is an inspiring little book, written by a general practitioner; the outgrowth of a lecture given to the medical students of Duke University on what their conduct should be during their early days of practice. Every medical student should get a copy of this book and read it carefully. The advice given is sound.

◆ ◆

The Comparative Anatomy of the Nervous System of Vertebrates Including Man

By C. U. Ariens Kappers, M.D., Director of the Central Institute of Brain Research, Amsterdam, and Professor of Comparative Neurology in the University of Amsterdam; G. Carl Huber, M.D., late Director of the Anatomical Laboratories and Professor of Anatomy, University of Michigan, and Elizabeth Caroline Crosby, Ph.D., Associate Professor of Anatomy, University of Michigan. In two volumes. The Macmillan Company, New York. 1936. Price, $16.

A truly monumental work, ten years in preparation, by acknowledged masters in this field. The more than 700 illustrations are all of them original, made from actual specimens. References in the text and in a bibliography appended to each section of the text document every statement made by the authors. These references of themselves are indicative of the extremely careful work done in the preparation of this text and cannot fail to have inestimable value not only for the research worker in human and comparative neurology but also for those who desire a general background in the subject. These books must be accepted as the most admirable and complete reference work extant for classes in human and comparative neurology. They should have a prominent place in the library of every medical school as every student of human embryology will find them useful in his studies. The publishers deserve commendation for their part of the work, and for helping to give to science an enduring and fitting reminder of the carefulness, thoroughness and outstanding ability of the late Dr. G. Carl Huber. The work is definitely a monument to him.

◆ ◆

Textbook of Psychiatry

By Arthur P. Noyes, M.D., Superintendent State Hospital for Mental Diseases, Howard, Rhode Island. 2d Ed. The Macmillan Company, New York. 1936. Price, $2.50.

A book written essentially for nurses working in this field. Emphasis is placed on the fact that the physical and mental components of the personality cannot be separated and that the nurse must, therefore, understand the needs of the mind no less than those of the body.

◆ ◆

Minor Surgery

By Frederick Christopher, M.D., Associate Professor of Surgery, Northwestern University Medical School. 3d Ed. W. B. Saunders Company, Philadelphia. 1936. Price, $10.00.

Completely revised, with the addition of much new material, such as new methods for promoting wound healing; ambulatory vein ligation; leech treatment of phlebitis; bismuth injection of warts; injection treatment of hernia, etc. Many new bibliographic references, in which the book abounds, have been added. Much of the material contained in the

preceding two editions has been amplified. This is an excellent book for the medical student. Every student should have a copy.

◆ ◆

Syphilis and Its Treatment

By William A. Hinton. The Macmillan Company, New York. Price, $3.50.

This book will prove useful to physicians, medical students and public health workers, as well as for dermatologists and syphilologists. It presents the most recent authoritative contributions to the study of syphilis and stresses the relative value of clinical and laboratory data in the diagnosis, treatment and prevention of syphilis. It is a clear, simple and relatively complete account of the disease.

◆ ◆

Handbook of Surgery

By Eric C. Mekie, Department of Clinical Surgery, University of Edinburgh. With a foreword by John Fraser, M.D., Regius Professor of Clinical Surgery, University of Edinburgh. William Wood & Company, Baltimore. 1936. Price, $4.50.

A book to get the student ready for an examination or for purposes of rapid review. It covers the field of surgery (nearly 700 pages); is well arranged; salient facts only are presented. Will have a place to serve as intended.

◆ ◆

Basal Metabolism in Health and Disease

By Eugene F. DuBois, M.D., Professor of Medicine, Cornell University Medical College. 3d Ed. Lea & Febiger, Philadelphia. 1936. Price, $5.00.

This revised edition aims to bring the subject into the realm of clinical medicine. It reflects the stabilization of the subject. The author, who speaks with authority, consolidates the gains made and has abandoned those fields which are either too dangerous or too sterile to justify further exploration. There is one exception: a new chapter is devoted to the field of physical channels of heat loss. The chapters dealing with surface area and normal standards have been rewritten and rearranged to cover the recent advances in these topics and the chapters on disease have been considerably augmented. This is an important contribution to the science of nutrition. It presents the bases of all dietaries clearly and scientifically.

◆ ◆

Textbook of Histology

By Joseph Krafka, Jr., Ph.D., M.D., Professor of Microscopic Anatomy, University of Georgia School of Medicine. The Williams & Wilkins Company, Baltimore. 1936. Price, $2.50.

A zoologist questions the balance in training secured by the old sequence of general biology, comparative anatomy, embryology and genetics. He appeals to biologists to admit histology to the college curriculum on the same footing as the last three sister sciences. He regards the study of the cell as being fundamental, as well as final, to all the other so-called medical sciences. As for his book: The chapters are short, hence can be correlated with a reasonable amount of laboratory work; with few exceptions the illustrations are free hand or camera lucida drawings of actual specimens; one section is given over to bone marrow. The clarity and conciseness of the text, and the small size of the book should make a large appeal to medical students.

◆ ◆

The Extra-Ocular Muscles: A Clinical Study of Normal and Abnormal Ocular Motility

By Luther C. Peter, M.D., Professor of Diseases of the Eye in the Graduate School of Medicine of the University of Pennsylvania. 2d. Ed. Lea & Febiger, Philadelphia. 1936. Price, $4.50.

The outstanding feature of this edi-

tion is the inclusion of an entirely new chapter on operative technique. While it includes some procedures of other surgeons which the author himself has practiced and found to be satisfactory, the technique offered is composed largely of principles and practices which Dr. Peter has himself evolved during his experience in muscle surgery. The author believes that satisfactory surgical results are to be obtained only through the careful study of the special needs of each patient and selection of that operation or procedure which best suits the requirements. The book offers an ample and varied technique that permits such a selection.

◆ ◆

Orthopaedic Surgery

By Walter Mercer, M.B., Ch.B., F.R.S., Surgeon Chalmer's Hospital, etc.; with a foreword by John Fraser, M.D., Regius Professor of Clinical Surgery, University of Edinburgh. 2d Ed. William Wood & Company, Baltimore. 1936. Price, $10.

A very complete, well written and abundantly illustrated textbook for students. No important recent advances have been overlooked. Especially commendable is the carefully selected, well arranged bibliography. It should prove to be a sound guide to the principles of orthopedic surgery being written by a man of wide experience in general surgery.

◆ ◆

Preventive Medicine

By Mark F. Boyd, M.D., Member International Health Division of the Rockefeller Foundation. 5th Ed. W. B. Saunders Company, Philadelphia. 1936. Price, $4.50.

The salient features of modern preventive medicine are presented concisely, representing the minimum knowledge of the subject which the student of medicine should possess. Those who require a more detailed knowledge are better served by consulting the carefully selected references given in the appendix. Much new material has been added and many chapters have been re-written or revised to be in keeping with newer knowledge on the subjects discussed. Recent developments in sewage treatment; mottled enamel and the rat from a public health standpoint represent new material. More extensive consideration is given to the vitamins, silicosis and recent data relating to general morbidity incidence. A good book for the student.

◆ ◆

Elementary General Psychology

By Samuel W. Fernberger, Professor of Psychology, University of Pennsylvania. Williams & Wilkins Company, Baltimore. 1936. Price, $3.

This work gives the beginner an excellent first orientation to the subject. A general background of psychological point of view and psychological fact so that he can read or study more adequately, easily and correctly in any of the more advanced special fields of psychology.

◆ ◆

Textbook of Physiology

By H. E. Roaf, M.D., Professor of Physiology, University of Liverpool. 2d Ed. William Wood & Company, Baltimore. 1936. Price, $4.25.

The author bases his text on adequate experimental data and attempts to lead the student from subjects with which he is already familiar, such as mechanics, to their application to problems of the animal body. He must understand the mechanical activities of the heart, for instance, before he can consider how that organ is regulated; if he knows the mechanical processes he knows part of the physiological relations. The book is divided into four parts: Mechanical Aspects; Chemical Aspects; Regulating Mechanisms; Maintenance of the Individual and Reproduction of the Species. The excellence of the illustrations is a striking feature. Students should like this book.

William's Obstetrics

By Henricus J. Stander, M.D., Professor of Obstetrics and Gynecology, Cornell University Medical College. 7th Ed. D. Appleton-Century Company, New York. 1936.

The general plan of Dr. William's last revision has remained unchanged consistent with new developments in obstetrics. Three new chapters have been added: one dealing with the hormones as related to pregnancy and the puerperium; one on the urinary complications, particularly pyelitis, and the third on analgesia and anesthesia. The book remains predominantly conservative in its teachings; hence should continue to make a large appeal to teachers and students of obstetrics.

◆ ◆

Pathology of the Nervous System

By J. Henry Biggart, M.D., University of Edinburgh. William Wood & Company, Baltimore. 1936. Price, $5.25.

An application of the general principles of pathology to the lesions of the nervous system, presented wholly for the benefit of the student; freely and well illustrated; convenient size yet inclusive of every important item in this field.

◆ ◆

Symptoms and Signs in Clinical Medicine

An Introduction to Medical Diagnosis. By E. Noble Chamberlain, M.D., University of Liverpool; Norman B. Capon, M.D., University of Liverpool. William Wood & Company, Baltimore. 1936. Price, $8.

Unlike other books on this topic, this book is of convenient size, well illustrated in black and white and colors, systematically arranged with many outstanding side heads and captions, making it comparatively easy to find a desired subject. The intern will find this a handy volume, aiding him to acquire a scientific application of the art of medicine and of the so-called preclinical sciences to clinical subjects. A rightful place of importance is given to physical signs which are demonstrated by the use of the unaided senses but other methods or procedures of investigation are not neglected.

◆ ◆

Syphilis Sive Morbus Humanus: A Rationalization of Yaws So-called

By Chas. S. Butler, M.D., Rear Admiral, U. S. Navy, Brooklyn, N. Y. 1936.

For many years, the author has been intensely interested in yaws. His writings on the subject are well known. In writing this book, his purpose was, first, to present the story of yaws in such a way that the layman can read and understand because popular education is necessary if yaws is to be attacked successfully; second, to expose the fallacy of the American origin of the syphilis hypothesis, and, third, to show the unity of so-called "yaws" and syphilis. The book is divided into seven chapters: 1. The story of syphilis; 2, brief history of the venereal diseases; 3, hero worship; 4, yaws, frambesia, treponematosis; 5, nomenclature; 6, adversaries; 7, argument. A "dramatic personae" and a glossary are appended to the text. This is a most fascinating work; well written in a style easily understood but, nevertheless, "meaty". Not only the specialist in venereal diseases but the general practitioner will find it a valuable contribution to the knowledge of the disease discussed. The author has done a fine piece of work and his efforts should meet with success.